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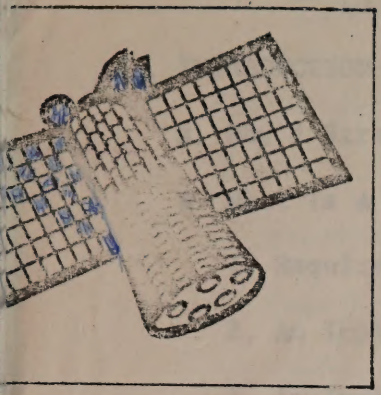
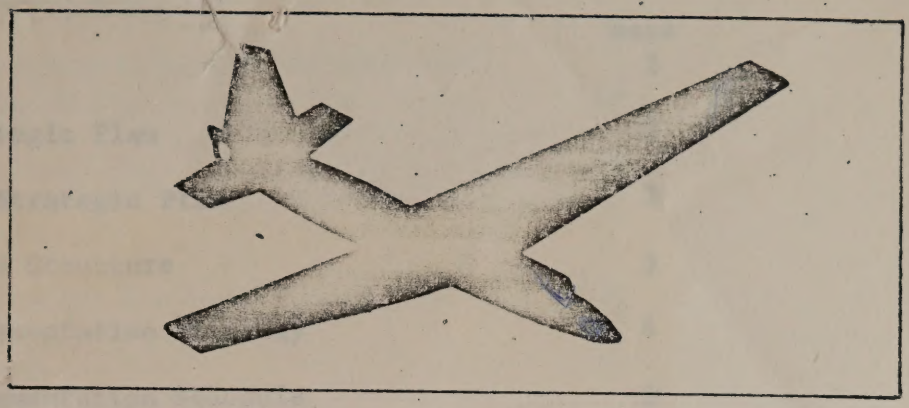
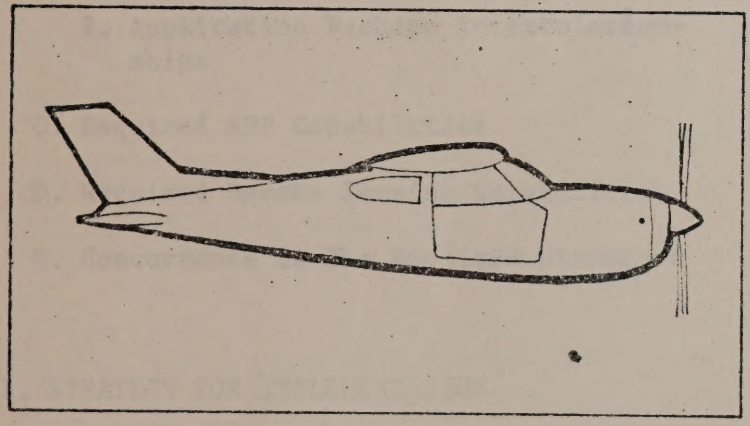
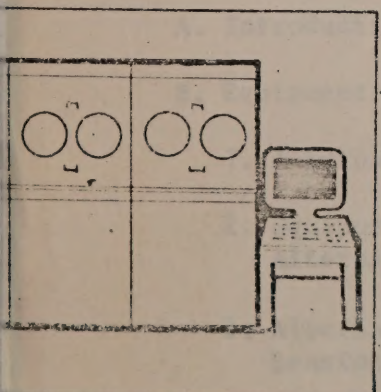
REPORT TO THE DIRECTOR





STRATEGIC PLAN FOR INFORMATION SYSTEMS MANAGEMENT





BUREAU OF LAND MANAGEMENT

REPORT TO THE DIRECTOR

July, 1975

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BLM Strategic Plan for Information Systems

Report to Director
July 1975

I. Introduction

This is a report to the BLM Directorate from the Information System Steering Committee. It is based upon the Strategic Plan materials prepared under contract by IBM Corp. and its counterpart BLM team during the June 1974 - April 1975 period.[1/]

The Information Systems Steering Committee found it difficult, in preparing this report, to determine the proper level of detail to be used. We recognized the Directorate's need for detailed enough information on which to base the major system development decisions involved. On the other hand, we strove for brevity, without being superficial. We trust that the following is in the correct degree of detail, and we stand ready to brief down or expand on any point desired.

1/ Strategic [illegible] for Information Systems, Vol. I: Executive Summary, Management Study prepared for BLM by the Strategic Plan Study Team (IBM and BLM).

A. Why a Strategic Plan

In considering past trends, and how they might extend into the future, it is clear that BLM is spending an increasing number of dollars and man-months in the handling of information of all sorts.

In view of the need to collect and handle increasing quantities of information, BLM has initiated a variety of efforts toward information system automation and use of remote sensing. These efforts have not been guided by any overall strategy or plan. This approach holds potential for overlap, inefficiencies, and major gaps in effective information management.

This Strategic Plan is designed to guide BLM into a comprehensive and integrated information system and provide a basis for more informed decisions about (1) the satisfaction of information system requirements, (2) the management of data, (3) the use of remote sensing technology, and (4) the acquisition of information system hardware and software.

B. What is the Strategic Plan

The IBM/BLM team went through a systematic process (outlined in fig. 1) in developing the basis for a BLM Strategic Plan. This report builds on that basis and attempts to lay out in terms of the Steering Committee's prospective the proposed Plan. The Steering Committee efforts can be summarized as identifying and defining three major components which must be understood, modified if necessary, and concurred in by the Directorate. When this is accomplished, the result will be the Bureau's Strategic Plan. The three basic components are (1) Required Structure, (2) An Implementation Strategy, and (3) An Implementation Schedule.

1. Required Structure

This component is an outline of the basic concept, major characteristics and framework of the Bureau's proposed plan. As such, it provides an overall guide, no matter what strategy and time frame is used to accomplish implementation. This component is described in some detail in Section II below.

Fifteen "Application Packages" are established in the structure. These are discrete and internally similar portions of the Bureau's total operation which should be sequentially analyzed and possibly make use of automated and remote sensing technology. As such, these are the "building blocks" which can be used to make the entire conversion manageable. Next, the Structure

includes an outline of specific ADP and Remote Sensing capabilities and supporting equipment needed to automate the application packages.

ADP capabilities are specific automated processes that the Bureau's system must be capable of, to support the Application Packages. The capabilities required prescribe the hardware needed. The Structure includes an outline of the remote sensing applications and technologies that are required and should be used to maximize efficiency of collecting and updating data.

2. An Implementation Strategy

This is an outline of the approach recommended for use in implementing the recommended Structure. This strategy is described in some detail in Section III. The implementation strategy includes (1) an analysis of the alternative ways to obtain use of the required ADP and remote sensing capabilities, along with a recommended approach, (2) an analysis of alternative organizational arrangements to staff and guide the implementation effort, along with a recommended alternative, (3) a recommended policy for integration of existing automated information systems into the Strategic Plan, (4) the necessary sequential steps or phases which should be followed by the Bureau to efficiently implement the automation and remote sensing technology outlined in the Strategic Plan, and (5) a recommended sequential priority to follow in the analysis and implementation of applications

3. An Implementation Schedule.

The third component of the proposed Strategic Plan is a detailed projection of costs and accomplishments which might be scheduled. This is presented in Section IV. Two long range implementation alternatives are presented, a short 7-year effort, which is about as fast as BLM could move, if all necessary funds and man-months could be made available, and a long 12-year effort which is about the maximum period the conversion could be stretched to cover, to minimize annual costs, without losing the momentum needed to complete the conversion.

Finally, this component of the proposed Strategic Plan establishes a detailed 2-year action schedule, and related cost. This cost is analyzed and its impact on on-going program funding shown, should a decision to absorb the related cost be considered.

C. Objectives and Use of This Report

The objective of this report to the Directorate is to provide a document for decisionmaking which will result in an approved BLM Strategic Plan. It is strongly suggested that the total report, as well as accompanying briefings and discussion, be well assimilated by the Directorate before any decisions are considered. An incremental series of decisions are recommended, as follows:

First, approve the Structure (after appropriate change if needed. This will not commit the Bureau to any specific action, but will provide an effective tool for coordinating either the recommended major conversion program or existing and ongoing ad hoc efforts.

Second, approve each element of the Implementation Strategy, (after appropriate change if needed). This still will not be a final commitment to any specific action, but, along with approval of the Structure will provide a comprehensive statement of policy or specific strategy which will guide Bureau staff in the design and execution of various implementation steps.

Third, approve either the long range schedule, short range schedule, or some combination of both. This will be based upon the Directorate's assessment of federal fund availability, and will provide a basis for preparing the needed action schedules, and budget justification documents.

Fourth, approve and implement the 2-year detailed schedule. This, of course, is the first real commitment of manpower and dollars involved.

This report, including the suggested approval statements, will then constitute the Bureau's Strategic Plan and can then be used throughout the Bureau to explain the effort to be undertaken and can be used at the Departmental level to justify those aspects of the plan which might require Departmental approval.

D. Management Considerations in Adopting the Strategic Plan.

- Benefits.

The Strategic Plan proposes to meet Bureau needs for better data and information to perform its management job. The Plan proposes to automate, or otherwise improve, the Bureau's handling of information. Many people in the Bureau believe that nearly all the data and information discussed as required in this report already exists (except for resource inventories). The Plan will simply make it available through a concerted effort to move data out of lower file drawers, archives and miscellaneous reports and records. Given the enormous volume of data and information about lands and relations of and with users, the Plan, when implemented, will provide the base to summarize and categorize information, so decisionmakers can sort out what they need quickly and effectively. In addition, the Plan will assist the Bureau in analyzing and comparing data, from past trends to present, for similar or unlike areas or functions, and for costs and inputs and outputs. Finally, the automated system provides an opportunity to assimilate information from others--data, bibliographic references, etc.---thus expanding the capacities of BLM decisionmakers.

- Risks

The value of improved information, and the importance of better information to the Bureau, should not blind us to the difficulties and risks inherent in the change process. We have seen the private companies, and local governments, in particular, unanticipated problems, operating delays, conflict among the

operating units with the computer application groups and the like, all of which put applications behind schedule and increase development and installation costs. Too, even completed computer programs frequently need reworking after a period of operation to achieve the initial and/or changed objectives. Finally, others have found that certain applications to computer technology proved simply unworkable and had to be abandoned after a significant investment in time and money had been incurred. All, or some, of these problems could strike the Bureau, despite best efforts to avoid them.

The potential for improvement in the quality of BLM decisions and actions, and the potential for gain in total Bureau effectiveness indicate that the Bureau should accept these risks realistically and proceed with the project and program.

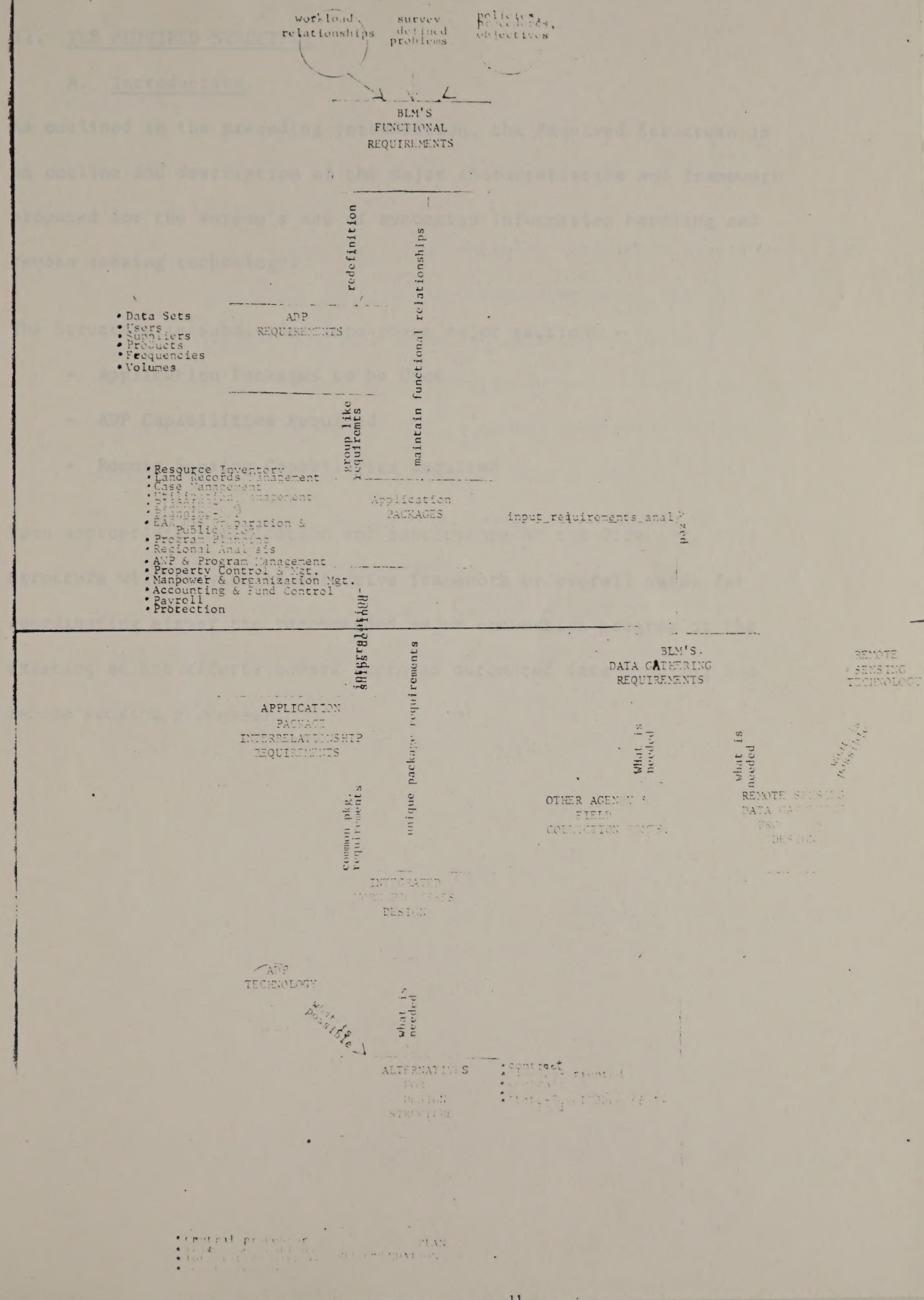
E. Impact of the Strategic Plan, if Fully Implemented.

The basic impact of the adoption of the Plan is to accelerate the already pronounced trend of the Bureau toward becoming an information-based agency. A whole series of forces have pushed BLM away from its old image of doing only routine work out on the public lands toward a considerably more sophisticated management and coordination of resources role. A better information system will aid the Bureau to cope effectively with its responsibilities. Out of such an improved position, other impacts--mostly positive, some negative--will occur.

A second set of impacts has to do with the ways of staffing, training and managing in the Bureau. By relying more on information and data systems, we will become increasingly dependent upon the systems "perception" of the world.

Constant effort will be needed to avoid the tendency to stay with the structure of the information system, rather than ensuring constant changes and adjustment to the actual environment of BLM. In addition, a significant number of Bureau employees at the professional level will require training over the next few years, to be fully [illegible] of the standing, developing and using the data and information systems. In addition, many employees--clerical and professional--will need specific training in the actual use of specific applications at the detail level. Although this training involves "costs" in the short run, it is required and will be valuable in the long run.

FIGURE 1 STRATEGIC PLAN DEVELOPMENT FLOWCHART



II. THE REQUIRED STRUCTURE

A. Introduction.

As outlined in the preceding introduction, the Required Structure is an outline and description of the major characteristics and framework proposed for the Bureau's use of automated information handling and remote sensing technology.

The Structure is subdivided into three major sections -

- Application Packages to be Used
- ADP Capabilities Required
- Remote Sensing Capabilities Required

Upon appropriate modification and concurrence by the Director, this Structure will provide an effective framework or overall guide for coordinating either the recommended major conversion program or the existing ad hoc efforts toward improved automated data handling and remote sensing processes.

B. Application Packages

Before discussing the rationale for the prescribed application packages, let's first clarify two terms.

- A BLM Function (sometimes called "program activity") refers to a body of authority, objectives, procedures, data, skilled staff and general manpower operating together to achieve some desired mission. These functions include Lands, Range, Forestry, Watershed, Wildlife, Recreation, Cultural Resources, Minerals, Cadastral Survey, Fire Protection, Roads and Trails, Access Transportation and Rights-of-Way, Personnel, Property Management, Program Planning and Management.
- An application package is a combination of similar work processes [1] used to support one or more of the above functions. The 15 application packages taken together include all the work processes needed to support all the above functions.

Three study team premises provided guidelines for application package definition:

- An implemented application package must provide useful product that will improve the manner in which a job under BLM responsibility is currently being performed.

---

[1] A "Work Process" is a specific task, such as editing and updating or collecting a specific kind of inventory data.

- A package must fully or partially satisfy BLM functional or program activity requirements, as they now exist, or were projected to exist by the functional program manager. The study team assumed no changes in the Bureau basic program or functional alignment.
- An application package should be defined so that it can be developed and implemented independently even though full utility may not be realized until several packages are implemented.

1. Description of Application Packages

The division of the Bureau workload into manageable groups (application packages) for purposes of analysis and implementation resulted in the following 15 application packages. The application package code is in parentheses after each package title.

- Resource Inventory (RES)

  The Resource Inventory package includes the processes of data gathering, storage, analysis, maintenance and statistical, graphic and narrative retrieval for all Bureau managed resources.

- Planning (URA)

  The URA package includes processes of compiling, maintaining, evaluating and revising URAs including data collection, summarization, analysis of resource potential, preparation of narratives, tables, maps and overlays.

- Planning (MFP)

  The MFP package includes the processes of compiling, maintaining, evaluating and revising Management Framework Plans, including analysis of URA data, resummarization, preparation and maintenance of narratives, tables, maps and overlays.

- Program Planning (PP)

  The Program Planning package includes the processes of developing, maintaining, evaluating and revising all Bureau program plans, specific project plans and associated studies. The package includes analysis of URA and MFP data, additional data gathering and storage requirements, resummarization and preparation of narratives, tables, maps, and overlays.

- Annual Work Planning and Program Management (AWP)

  The Annual Work Planning and Program Management package includes the processes of data gathering, storage, analysis, maintenance and production of tables and narratives as necessary to support preparation and maintenance of advices, directives, AWPs, operating budget, progress reporting, program monitoring and functional evaluations.

- Accounting and Fund Control (AFC)

  The Accounting and Fund Control package includes the processes of receiving, accounting and disbursement of Bureau funds, expenses and revenues. This package includes financial management in the areas of data recordation, storage, maintenance, summarizations and production of tables and reports to meet various requirements.

- Payroll (PAY)

  The Payroll package includes the processes of data recordation, storage, maintenance, analysis and production of paycheck data, payroll tables and required reports.

- Land Records Management (LR)

  The Land Records package includes the processes of data gathering, storage, analysis, maintenance, and statistical, narrative and graphic, retrieval of MT, supplemental and survey plats, field notes and associated historical indices.

- Case Management (CM)

  The Case Management package includes the processes of receiving, accounting, recording, docketing, appraising and tracking all case types doen in the Bureau. This package will support requirements for data gathering, storage, update and statistical, narrative and graphic retrieval of case information.

- Utilization Management (UM)

  The Utilization Management package includes the processes of data gathering, storage, analysis, maintenance, statistical and graphic retrieval for compliance checks, contract administration, trespass, billing, reports and record keeping functions.

- Manpower and Organization Management (MOM)

  The Manpower and Organization Management package includes the processes of manpower planning and utilization and personnel records management in terms of data recordation, storage, summarizations, analysis and production of tables and required reports.

- Property Control and Management (PCM)

  The Property Control and Management package includes the processes of acquiring maintaining and accounting for Bureau property including structures, facilities, communication systems, equipment, supplies and tools; issuance and movement of tools and equipment. The package includes processes of data recordation, storage, maintenance, summarizations and productions of tables and required reports.

- Protection (PRO)

  The Protection package includes the processes of fire management and fire operations in the Bureau in terms of data gathering, recordation, storage, maintenance, analysis and production of tables, maps, and overlays.

- Regional Analysis (RA)

  The Regional Analysis package includes the processes of analyzing the significance of resource values in place to the market or other clientele they serve. This includes capability to relate resource values in specific areas, and in various levels of aggregation, to the using publics, industries, and economies, in a variety of impacted or related regions. The package includes the processes of data gathering, storage, analysis and manipulation, maintenance and production of tables, narratives, maps and overlays, and reports.

- EAR/EIS Preparation and Publication (EIS)

  The EAR/EIS Preparation and Publication package includes the processes of developing and compiling of environmental impact statements, environmental analysis records or any other environmental analysis report or any other environmental analysis required prior to a BLM action or project which results in documentation.

Processing (PRO)

The Processing package includes the processes of file management and file operations by the System in terms of data gathering, recordation, storage, maintenance, analysis and production of tables, maps, and overlays.

Regional Analysis (RA)

The Regional Analysis package includes the processes of analyzing the significance of resource values in place to the market or other clientele they serve. This includes capability to relate resource values in specific areas, and in various levels of aggregation, to the using publics, industries, and economies, in a variety of impacted or related regions. The package includes the processes of data gathering, storage, analysis and manipulation, maintenance and production of tables, narratives, maps and overlays, and reports.

EAR/EIS Preparation and Publication (EIS)

The EAR/EIS Preparation and Publication package includes the processes of developing and compiling of environmental impact statements, environmental analysis records or any other environmental analysis report or any other environmental analysis required prior to a BLM action or project which results in documentation.

These 15 application packages allow the Bureau a different way of organizing computer systems and computer programming to meet needs than is currently being done. Current ADP systems are developed in response to various specific problems which result in duplication of data and effort and inability of one system to easily share data with another system. We will have the means, through the Strategic Data if implemented, to develop systems that will support problem solving on a unified basis. For example, the Bureau currently has at least four separate ADP systems to support and track various utilization management processes. These include range utilization, material sales, coal leases and other-than-coal leases. The information available from each is not easily combined for any utilization management statistics or summary reports. Computer programming sub-routines are duplicated. Development and implementation of one Utilization Management package which considers all land use information and process needs will bring these "bits and pieces" together.

There is application problems alike the Bureau a difference way of organizing computer system and computer programming to meet needs that is currently being done. Current EDP systems are developed in response to various specific problems which result in duplication of data and effort and inability of one system to easily share data with another system. We will have the means, through the Strategic Data if implemented, to develop systems that will support problem solving on a unified basis. For example, the Bureau currently has at least four separate EDP systems to support and track various utilization management processes. These include cargo verification, material sales, coal leases and other-than-coal leases. The information available from each is not easily summarized for any utilization management statistics or summary reports. Computer programming sub-routines are duplicated. Development and implementation of new Utilization Management programs which consider all land use interaction and process needs will bring these "bits and pieces" together.

2. Application Package Interrelationships

The data relationships of one application package to others is an important aspect in the development of an integrated information system for the Bureau. The relationships among packages clearly display two facts verified during the Strategic Plan study effort that:

- An integrated BLM information system has a large number of application interrelationships.
- removing an application from the system also removes and weakens the integrated nature of the system and benefits which are realized from that integration.

The nature of the package interrelationships varies. In some cases the interrelationship is mandatory, i.e., the Resource Inventory/URA relationship. To provide a comprehensive URA, access to resource inventory data is a prerequisite. In preparing a URA frequent references to resource data are required. The problems identified during the Strategic Plan study place much emphasis on the need for faster access to more accurate inventory data. Implementation of the Resource Inventory application would thus be the first step in providing the faster access and the tool to support more accurate, up-to-date URAs.

A mandatory relationship is determined when the necessary support of one package for another cannot be cost effectively accomplished manually. Cost-effectiveness factors that were considered in determining a mandatory relationship were:

- Frequency the interrelationship is needed.
- Volume of data passing between the two applications.
- Number and geographic proximity of application area users.
- Current Bureau policy as to the similar organizational

responsibility of the two applications (both are State-level functions or both are District-level functions).

- The extent to which current procedures satisfy application interrelationship requirements.
- The dynamic/stable nature of the data which passes between the two applications. Does the data change too fast to permit manual support?
- Geographic dispersion of data sources.

If two application packages have a relationship but it is not strong according to the above factors, the relationship is considered optional-nice to have. The mandatory/optional decisions recorded in the following Applications Interrelationships Chart reflect:

- Study Team interpretation of the data and process needs identified during this study.
- Experience of Study Team members and contacts made during this study. (Personal experiences of other Bureau personnal may result in different opinions as to the mandatory or optional nature of an interrelationship. Ironing out these differences is one of the objectives of the Detailed Requirement Definition-described in III. E. Necessary System Implementation Steps.)

Reading down a column, you will find the application packages which are mandatorily or optionally required to adequately perform the application in the column header.

Reading across a row, you will find the application packages which are mandatorily or optionally supported by the application in the row stub.

APPLICATIONS SUPPORTED

APPLICATIONS REQUIRED	1 Resource Inventory	2 URA	3 MFP	4 Program Plans	5 AWP	6 Accounting and Fund Control	7 Payroll	8 Land Records	9 Case	10 Utilization	11 Manpower & Organization	12 Property	13 Protection	14 Regional Analysis	15 EAR/EIS
1. Resource Inventory		M			M				M				M		M
2. Planning - URA			M	O											
3. Planning - MFP				M					O				O		O
4. Program Planning		O			O	M					M				
5. AWP and Program Mgmt.				M		O						O			
6. Finance: Accounting and Fund Control				M	M				M	M	M	O	M		
7. Finance - Payroll						M					M		M		
8. Lands Records Mgmt.	O	O	O						O						O
9. Case Mgmt.		O	M			O		M		M					O
10. Utilization Mgmt.			M	M		M		O							
11. Manpower and Organization Mgmt.				M	O								M		
12. Property Control and Mgmt.		O	O		O	O							M		
13. Protection			O			M									
14. Regional Analysis		M	M	M					M						M
15. EAR/EIS Preparation and Publication			O						O						

FIGURE 2: Application Interrelationships

M: The relationship between the two application packages is mandatory.

O: The relationship between the two application packages is optional.

C. Required ADP Capabilities

ADP capabilities are the kinds of data processing tools needed to support the processes in the application packages. Ten ADP capabilities have been identified as necessary to support the fifteen application packages:

(1) structured data handling-update

(2) structured data handling-retrieval and output

(3) mapping and graphics-update

(4) mapping and graphics-retrieval and output

(5) text processing-update

(6) text processing-retrieval and output

(7) text processing-composition

(8) special processes

also modeling capability

(9) computer assisted training

(10) data base-data management.

Before developing one of these ADP capabilities, all of the application packages affected must be considered. This provides the necessary information to design the maximum amount of comprehensiveness into each capability. In this way, the ADP capability can be designed and used to support multiple work efforts. For example, if structured data handling - update capability is developed initially for use by the Resource Inventory Application Package, when the Case Management Application Package is implemented (e.g., OCS lease data introduced into the systems), the capability would be available for its use.

By developing an ADP capability in this way, the initial effort may be increased, but the subsequent benefits are significant in avoiding repeated development efforts. When other packages are implemented the ADP capabilities needed will already exist, requiring only the appropriate development of specific application programs. The savings in development time and the attendant rapidity of implementation are the anticipated benefits of this approach.

The following pages provide a brief definition of each of the ten ADP capabilities and how they may support application packages and improve Bureau operations.

1. Structured Data Handling-Update

This capability allows "files" of information and data to be established with the ability to keep the files accurate and current by accepting change information.

2. Structured Data Handling - Retrieval and Output

This capability allows the user to search through all the data stored in the computer until the desired data is found and extracted. The extracted data is then displayed in user-defined or standard format. The display can be on a terminal screen and/or hard copy.

3. Mapping and Graphics - Update

This capability allows initial storage of digitized map data and the addition, change or deletion actions to that map data by authorized personnel. This capability is similar to the structured data handling capability except for technical considerations. Graphic updates of lines, points and polygons, use a different technology than updated involving letters and numbers.

4. Mapping and Graphics - Retrieval and Output

This capability allows the user to search through all the digitized map data stored in a computer until the desired geographic and attribute data is found and extracted. The extracted data is then displayed graphically at a user-defined scale. The display can be on a terminal screen and/or hard copy (paper or mylar).

1. Structured Data Modification

This capability allows "files" of information and data to be established with the ability to keep the files accurate and current by accepting change information.

2. Structured Data Handling - Retrieval and Output

This capability allows the user to search through all the data stored in the computer until the desired data is found and extracted. The extracted data is then displayed in user-defined or standard format. The display can be on a terminal screen and/or hard copy.

3. Mapping and Graphics - Update

This capability allows textual message or digitized map data and the addition, change or deletion sections to that map data by authorized personnel. This capability is similar to the structured data handling capability except for technical considerations. Graphic updates at times, polaris and polygons use a different technology than updated involving letters and numbers.

4. Mapping and Graphics - Retrieval and Output

This capability allows the user to search through all the digitized map data stored in a computer until the desired geographic and attribute data is found and extracted. The extracted data is then displayed graphically at a user-defined scale. The display can be on a terminal screen and/or hard copy (paper or mylar).

5. Text Processing - Update

This capability allows initial storage of textual information from abstracts, periodicals, books, research documentation, etc., and changes to that textual data by authorized personnel.

6. Text Processing - Retrieval and Output

This capability allows the user to search through all or part of the stored textual data using keyword(s) or subject matter parameters until the desired text is found and extracted. The extracted data is displayed in a predefined, standard format (indentation, spacing, margins), established during the development of this capability.

7. Text Processing - Composition

This capability provides a full English language composition facility with page formatting, page headings, footings, page numbering and margin justification. The ability to copy, move, erase and add text - from a single character to a whole document - is part of this capability.

5. Text Processing - Update

This capability allows initial storage of textual information from abstracts, periodicals, books, computer documentation, etc., and changes to that textual data by authorized personnel.

6. Text Processing - Retrieval and Output

This capability allows the user to search through all or part of the stored textual data using keyword(s) or subject descriptor parameters until the desired text is found and extracted. The extracted data is displayed in a predefined, standard format (indentation, spacing, margins), established during the development of this capability.

7. Text Processing - Compositing

This capability provides a full English language composition facility with page formatting, page headings, footings, page numbering and margin justification. The ability to copy, move, erase and add text - from a single character to a full document - is part of this capability.

8. Special Processes

This category is a catch-all area for those many capabilities which allow analysis of complex situations, trend predicting, forecasting, simulation and modeling. (Efficient use of this capability assumes structured data handling-retrieval and output is operational.) Examples of the kinds of processes supported by this capability are:

- polynomial manipulation
- matrax manipulation
- time series analyses
- variance analysis
- interpalation
- simulation

9. Computer - Assisted Training

This capability provides an tutorial approach of instructing the user through each step of an ADP - supported Bureau function. No special control language or formal programming experience is required of the user.

10. Data Base and Data Management

This capability provides the means of storing data in such a way that it can be related to other data to form meaningful information.

8. Special Processes

This category is a catch-all area for those many capabilities which allow analysis of complex situations, trend prediction, forecasting, simulation and modelling. Definitions for each of this capability assume dynamic data handling-retrieval and output is operational. Examples of the kinds of processes supported by this capability are:

. polynomial manipulation

. matrix manipulation

. time series analyses

. variance analysis

. interpolation

. simulation

9. Computer - Assisted Teaching

This capability provides an internal application of instruction the user through each step of an IAP - supported System Document. No special computer language or formal programming experience is required of the user.

10. Data Base and Data Processors

This capability provides the means of storing data in such a way that it can be related to other data in form meaningful information.

It is required that each capability be available to the user at the user's site (District Office, OCS or State Office, WO, etc.), and that each is connected directly to a central computer through some sort of telecommunications capability.

Telecommunications is the process of transmitting data over long-distance communication facilities such as telephone lines. Telecommunication is the hook-up to connect the ADP capabilities to the users. Data is passed between an application package/subpackage in a computer and telecommunication devices connected together to form a network. In the network, the telecommunication devices are usually terminals that allow personnel working at them to interact directly with the central computer.

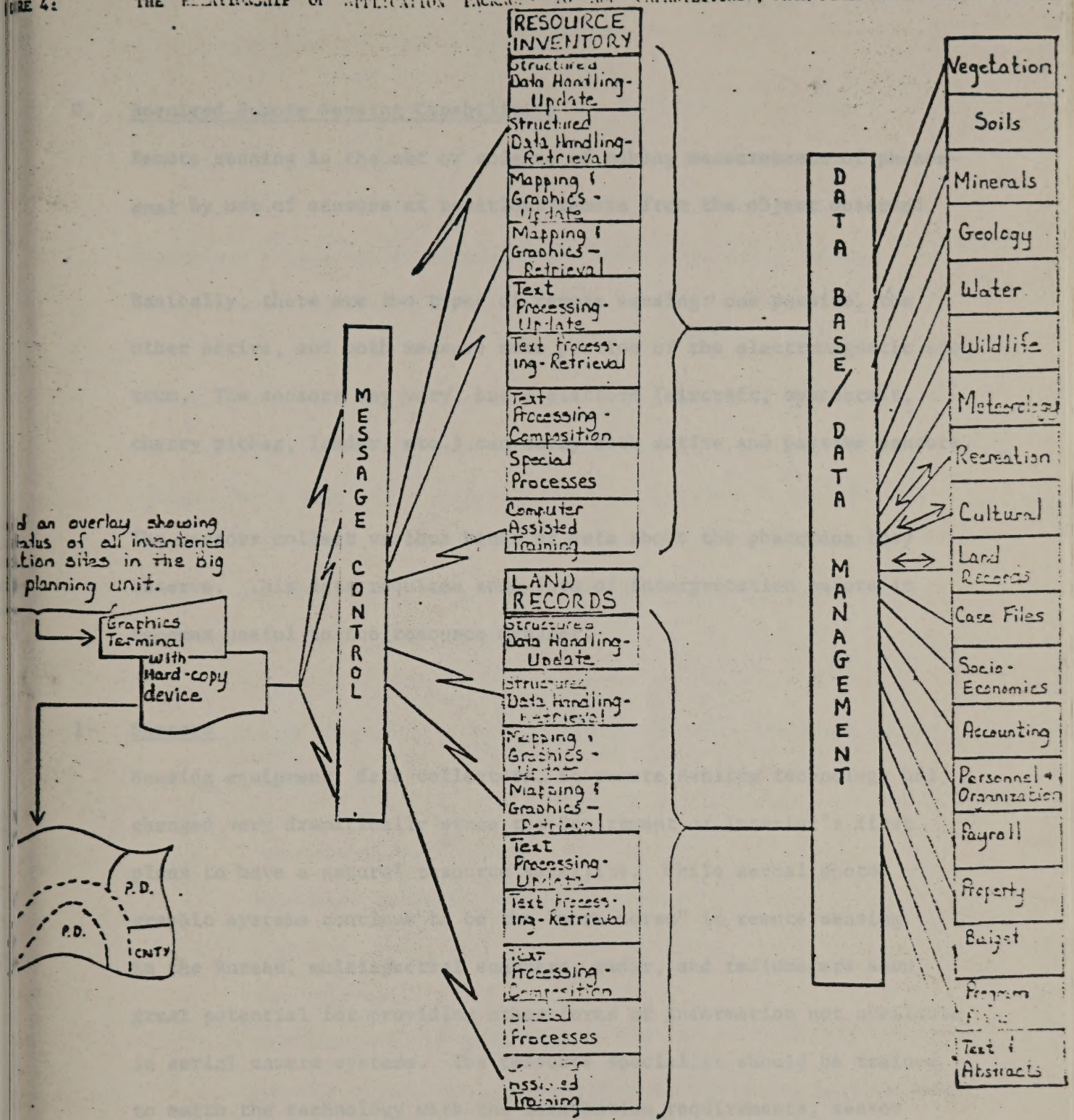
A terminal may be one of a variety of devices such as a keyboard (with or without a display), a printer, another computer, a graphics tablet.

FIGURE 3: RELATIONSHIP OF ADP CAPABILITIES TO THE APPLICATION PACKAGES

ADP CAPABILITIES \ APPLICATION PACKAGES	Real Prop Inventory	Land Records	Case Management	Utilization Management	Planning: FRA	Planning: FFP	PAR/FTS Preparation & Publication	Program Planning	Regional Analysis	[illegible] Time Management	Property Control & Management	Manpower & Org. Management	Accounting & Fund Control	Payroll	Protection
Structured Data Handling - Update	X	X	X	X	X	X		X	X	X	X	X	X	X	X
Structured Data Handling - retrieval & output	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Mapping & Graphics - Update	X	X	X		X	X		X	X						X
Mapping & Graphics - Retrieval & output	X	X	X	X	X	X	X	X	X						
Text Processing - Update		X			X	X	X	X				X			X
Text Processing - retrieval & output			X		X	X	X	X			X				X
Text Processing - Comppsition	X	X			X	X	X	X							
Special Processes			X	X		X	X	X	X	X	X	X	X	X	X
Computer Assisted Training	X	X	X	X	X	X		X	X	X	X	X	X	X	X
Data Base - Data Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

X - Indicates that the ADP capability is required to fully support the application package.

URE 4: THE RELATIONSHIP OF APPLICATION PACKAGES TO APP CAPABILITIES, DATA FILES AND TELECOMMUNICA

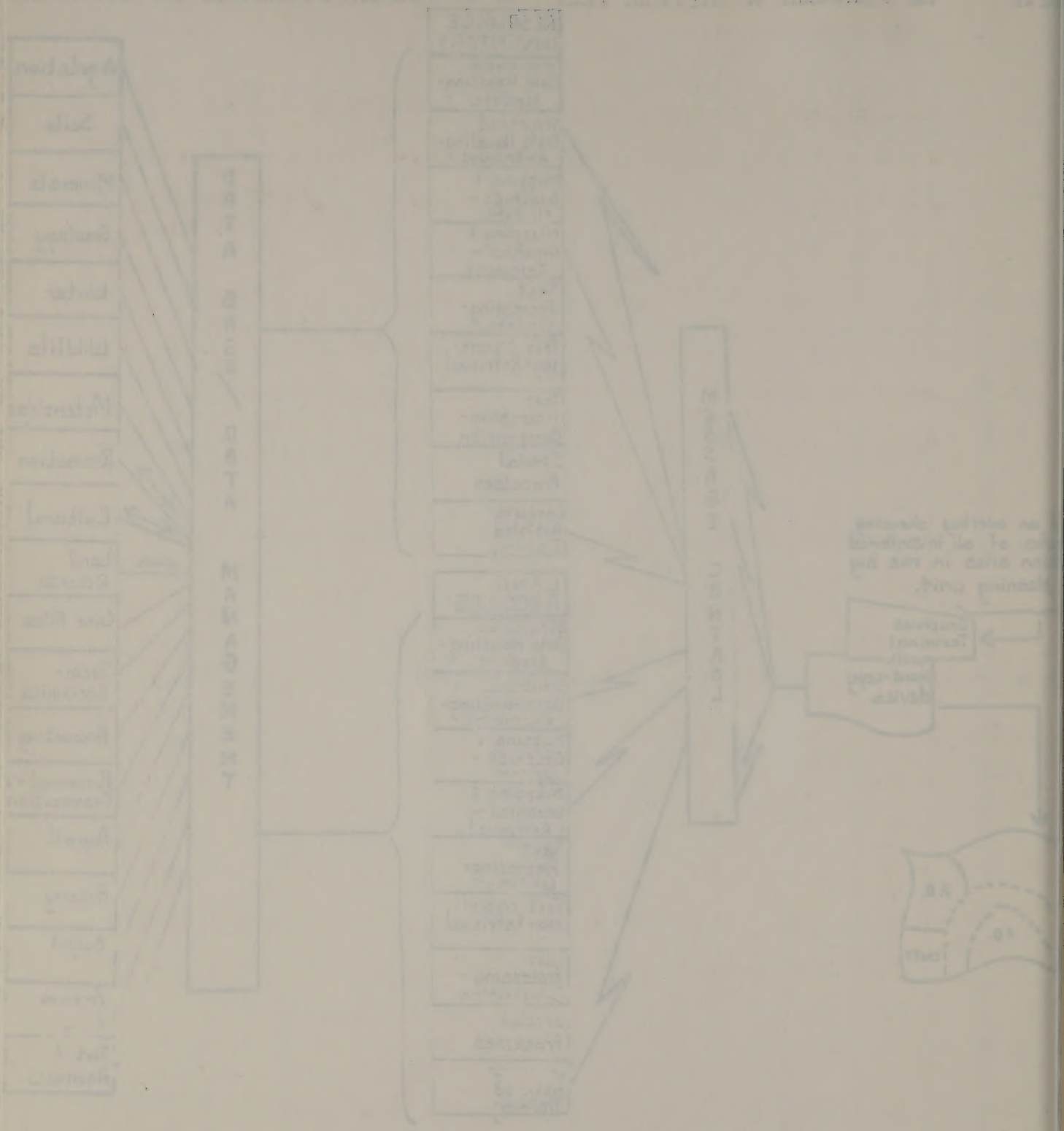


esource specialist has an
mation requirement.

Through telecommunications, the information requirement is transferred to the appropriate application package capabilities. The data base - data management capability activates the appropriate data files, extracts the requested data, returns it to the application packages. The package capabilities manipulate the data and merge it through designed package interrelationships into the requested format.

The data is transferred via telecommunications through message controls

er as requested.



D. Required Remote Sensing Capabilities

Remote sensing is the act or science of making measurements of phenomenal by use of sensors at positions remote from the object observed.

Basically, there are two types of remote sensing: one passive, the other active, and both measure some portion of the electromagnetic spectrum. The sensors may vary, but a platform (aircraft, spacecraft, cherry picker, ladder, etc.) can carry both active and passive sensors.

The sensors collect various kinds of data about the phenomena they observe. This data requires some form of interpretation before it becomes useful to the resource manager.

1- Sensors

Sensing equipment, data collectors, in remote sensing technology has changed very dramatically since the Department of Interior's first plans to have a natural resource satellite. While aerial photographic systems continue to be the "work horse" in remote sensing in the Bureau, multispectral scanners, radar, and radiometers show great potential for providing other forms of information not available in aerial camera systems. The resource specialist should be trained to match the technology with the information requirements, sensor to job. Remote Sensing capabilities required to support the application packages include the following:

- Camera Systems

This capability measures the visible portion of the electromagnetic spectrum only. With the use of filters and multilens cameras, multispectral images can be obtained, and continuous strip images can be exposed by use of special cameras.

The scale and resolution vary with the focal length of the camera and the height above the ground. Photography, the product of the system, has a very rigid mathematical solution when it is used to obtain measurements. Most aerial photography has been obtained in black and white, although natural color and color infrared are being used in many formats today.

Application of this capability will improve Bureau operations in the following ways:

- Inventory forest stands
- map range and wildlife forage types
- map soil types
- map watersheds
- map land use (in place)
- provide a base for engineering projects-roads, utility lines recreation sites, dam sites.

- Multispectral Scanning Systems

This capability opens the electromagnetic spectrum from ultra vilot

into the far infrared. Through a single lens system the amount of energy reflected by a resource can be split into several regions of the spectrum. By filtering techniques, specific types of sensors, and cooling systems the energy is recorded electronically for as many as twenty-four levels. The results when compared to ground measurements can identify specific elements which give meaningful information to the manager.

Application of this capability will support the following operations in the Bureau.

- to quantify the various elements of the resource inventory by comparing several bands
- detecting polution in streams and on lands
- detecting insect infestation
- measurement of snow pack
- use in detection of fire "hot spots"
- location of archeological sites

- Radar

This capability can be used to make measurements that are not weather dependent.

Application of this capability will support the following operations in the Bureau.

- geological formations for mineral locations
- possible location of ground water

into the far infrared. Through a single lens system the energy of energy reflected by a reactive can be split into several regions of the spectrum. By filtering mechanisms, specific types of energy, and cooling systems the energy is recorded electronically for as many as twenty-four levels. The results when compared to ground measurements can identify specific elements which give meaningful information to the manager.

Application of this capability will support the following operations in the System.

- to monitor the various elements of the resource inventory
- by comparing several bands
- detecting pollution in streams and on lands
- detecting insect infestation
- measurement of crop yield
- use in detection of late "hot spots"
- location of archeological sites

Note:

This capability can be used to make measurements that are not depended.

Application of this capability will support the following operations in the System.

- geological information for mineral locations
- possible location of ground water

- Platforms

Satellites and aircraft are the platforms that carry the various sensors whether they are cameras, multispectral scanners, radar or other types of sensors.

NASA will launch LANDSAT III in 1977. The resolution of the television systems will be double the present system and will be pancromatic only. It will have a thermal channel not on the present "Bird", which will view the 8 to 14 micrometer band of the infrared .

In 1980, a new generation of resource satellites EOS are planned. The configuration of the instrumentation has not been fixed.

2- Applications System Verification Test

In the immediate future an "Applications System Verification Test" in conjunction with NASA will be undertaken. The test will produce an operational system for analyzing remotely sensed data. The latest techniques will be used throughout. This includes the gathering of a data as well as an analysis of same.

3- Analytical Capabilities for Remote Sensing

If remotely sensed data derived from any sensor source cannot be interpreted by standard "eyeball" techniques, it will be reformatted to be received by the system for automatic interpretation. The analytical processes will have programs to include corrections for spectral, spatial, and temporal data; overlay one scene upon another,

or superimpose map data over the scene; and print out differences or single thematic information.

The major feature of the system is the interactive capability between the equipment and the resource manager. Today many systems on the market do not have this feature and only do density slicing or color-enhancing types of processes.

The system, the scanner, the image analyzer console, the image memory bank, and the graphics display will be correlated through a mini-computer.

Application of this capability will provide a discriminative analysis of the scene to detect:

- land use
- hydrological analysis
- vegetative trends
- soil classification
- geological formations
- environmental quality and impact
- coastal zone resources
- ice movement
- snow pack
- strip mining monitoring
- timber trespass
- range overgrazing

4- Ground Data Collection Systems

Data collection systems consists of the sensors, an interface and the satellite. These systems provides a means of collecting information from remotely located instruments (rain guages, temperatures, stream guages, snow pillows, anemometers, water quality stations) and telemetering this information via the satellite, to a ground tracking station to a computer, and finally to the user who puts the information into some management practice.

Application of this capability will improve or assist Bureau operations in the following ways:

- data collection stations (i.e. field weather stations) can be automated
- reduce the radio traffic on the BLM network through which the data from above is now fed into a central office.
- Locate needed stations in remote areas to gather data.

There are nine recommended capabilities for the analysis of remotely sensed data. The relationship between various analytical capabilities and the application packages is shown on the page following.

- Interactive: a process of using ADP equipment where a person may interact with the machine to assure correct results.
- Full Color Display: A color television capability upon which the various grey levels of imagery can be displayed as colors.
- Printing/Plotting: A capability to produce hard copy maps or photographic prints when driven by a computer.
- Camera Imagery: A photograph in black and white, or color
- Multispectral Imagery: A capability to generate photographs from computer compatible tapes, and will image in any portion of the the spectrum. May be viewed on a cathode ray tube.
- Radar Imagery: A capability to generate photographs from a computer compatable tape produced from radar equipment. May be viewed on a cathode ray tube.
- Radimetric Corrections: Are factors which are applied to computer interpretative techniques which correct the scene for the amount of energy being reflected by the phenomena being viewed.
- Geometric Corrections: Are factors which are applied to an image to correct it for geometric position.
- Overlay: Is the ability of the computer to overlay one scene upon another of the same areas, or overlay a live map over and image and correct for geodetric positions.

FIGURE 5: RELATIONSHIP BETWEEN APPLICATION PACKAGES AND REMOTE SENSING CAPABILITIES

Remote Sensing System Capabilities \ APPLICATION PACKAGES	Resource Inventory	Land Records	Case Management	Utilization Management	Planning: BA	Planning: CIP	EAR/EIS Preparation & Publication	Program Planning	Regional Analysis	EIP & Project Plan Management	Property Control Management	Manpower & Organization Management	Accounting & Fund Control	Payroll	Protection
INTERACTIVE	X			X	X	X	X	X	X						X
FULL COLOR DISPLAY	X			X	X	X	X	X	X						X
PRINTER/PLOTTER	X			X	X	X	X	X	X						X
CAMERA IMAGERY	X			X	X	X	X	X	X						X
MULTISPECTRAL IMAGERY	X			X	X	X	X	X	X						X
RADAR IMAGERY	X			X	X	X	X	X	X						X
RADIMETRIC CORRECTION	X			X	X	X	X	X	X						X
GEODETIC CORRECTION	X			X	X	X	X	X	X						X
OVERLAY	X	X		X	X	X	X	X	X						X

E. Concurrence in Required Structure

Concurrence in the Structure provides policy direction for BLM personnel engaged in implementing the Strategic Plan. It also provides criteria and coordinating ongoing or ad-hoc system proposals. Concurrence at this point is not to be interpretted as a final Directorate sign-off on the detailed contents of the Strategic Plan. Concurrence with details will come on an incremental basis at various management check-points scheduled during the implementation process.

_____ _____

I Concur Date

III. STRATEGY FOR IMPLEMENTATION

A. Introduction

The implementation strategy is the approach recommended for implementing the structure described in section II. This strategy includes:

- An analysis of the alternative ways to obtain use of the required ADP and Remote Sensing equipment capability, along with a recommended approach and list of specific equipment items needed to provide the needed ADP and Remote Sensing capabilities.

- An analysis of the alternative organizational arrangements available to staff and guide the implementation effort, along with a recommended alternative.

- A recommended policy for use of existing automated systems.

- The necessary sequential steps or phases which should be followed by the Strategic Plan implementation staff and the rest of BLM to efficiently convert to the use of automation and remote sensing technology outlined in the Required Structure Section, and a more detailed list of design and implementation activities required.

- A recommended sequential priority to follow in the analysis and implementation of application packages.

Upon appropriate modification and concurrence by the Director, this Implementation Strategy, along with the Structure, will provide a comprehensive statement of policy and a specific strategy which will guide Bureau staff in the design and execution of the various implementation tasks.

B. EQUIPMENT APPROACHES

1. Alternative Approaches for ADP equipment

The following section is directed initially at equipment alternatives to meet the ADP capability requirements discussed in Section II of this report. Some of the equipment would also support the Remote Sensing capability requirements discussed in Section IID. The discussion at the end of this section indicates what is now known about additional equipment needed to fully support remote sensing.

Several alternatives have been considered regarding the appropriate equipment configuration for BLM:

a. a departmental computer center where the Bureau would share in the use of one large computer center operated by DOI

b. use of other governmental agencies to do our data processing

c. a Bureau computer center limited to mission-oriented workload using some other ADP facility(s) for administrative functions

d. a Bureau decentralized configuration where each region or State Office has its own computing power seperate from a central source.

e. a Bureau centralized configuration where most of the computing power is concentrated at a single facility and Bureau offices are hooked to it through some kind of communication lines (telephone lines, leased private lines). This is the recommended configuration. (This alternative does not assume a particular operational approach to a centralized configuration. There are several operational approaches: facilities management; service contract; own/lease.)

Discussion of these five alternatives and the advantages and disadvantages of each resulted in the recommendation for a Bureau centralized configuration for reasons of staff, user control, cost, ADP capability, workload, management control, and effectiveness.

- Staff

  Regardless of the alternative, the number of computer programmers and related professionals will increase because of the magnitude of the projected workload. The only skill really affected by the selection of an alternative is computer operators. In this regard Alternatives A & B should require fewer Bureau computer operators. The decentralized alternative will require an increase in this skill because of the number of individual sites the Bureau centralized alternatives (C & E) will probably maintain the same level of operators.

- User Control

The centralized concept provides user control over the use of available computer processes and easy interface with the data base without requiring programming support at the user site. The "tutorial" concept of a central processor with attached remote terminals guiding the user through each step of a process with no special control language or formal programming experience brings very cost-effective computer power to users. From a Bureau management point of view user control is less effective overall if programming support at each site is necessary as is the case with the Bureau decentralized alternative. However, from the user's point of view, the decentralized alternative offers more user control than the other four.

User control under alternative A or B is theoretical at this point. DSC experience to date in the ADP shop being a user of some other agency's configuration indicates that user control is inadequate. In Alternative C the situation would seem similar since some of our applications would be on someone else's computer.

- Cost

The hardware cost estimate of a centralized equipment configuration is one-third the cost estimate compared to a state-level decentralized concept. Furthermore, we won't have duplication of site preparation costs.

According to a Departmental study conducted in the summer of 1974, the Bureau's share of hardware (and software) costs in a DOI computer center would be less than in the recommended configuration due to lack of redundancy. However, there is a definite lack of cost data and projections upon which to determine the facts. This same lack of cost data is true of Alternative B also.

The mission-oriented alternative is a variation of Alternative B in a cost discussion since we would need our own computer for mission-oriented areas as well as sharing costs for processing non-mission oriented work on someone else's computer.

ADP Capability

Assuming that the Bureau wants to establish as much ADP capability as possible with minimal cost and time, it is the centralized Bureau alternative with a central computer, and phasing in of the field sites which most effectively satisfies this requirement. Though the cost may not be high in the alternatives where we don't have to invest in a computer (alternatives A and B), establishing ADP capability will take take much longer. The Departmental ADP Strategy is still at the conceptual level. It is difficult to ascertain specific impact and and specifics are the heart of successful ADP operations. The Bureau must continue efforts to resolve the ADP support problem immediately.

Workload

BLM requires a large-scale computer to satisfy information needs. It must be recognized that no single agency is going to have equivalent excess capacity. Accordingly, a decision to depend on other agencies will result in fragmented computer support from multiple agencies. Buying as needed services is good for individual computation programs (and the practice will not be eliminated in the Bureau centralized recommendation) but not for integrated systems managment which is the goal of BLM.

In alternatives A, B, and D, where the Bureau management does not have first-level control, it also has less flexibility in dealing with workload crises and change.

The ability to have integrated systems management for BLM in a DOI facility is unknown. Because BLM-ADP support requirements are so large, the necessary hardware and software system is itself a large system that will grow. Any advantages of a DOI center would apply equally if not to a greater extent to the BLM-system as a stand-alone center. One would have to evaluate the total system requirements of each DOI agency to see the incremental benefit of adding additional functions to the BLM function. This would delay by an unknown number of years, the implementation of any BLM strategic plan.

Alternative C is especially disadvantaged on this consideration. On the surface, it appears that a useful distinction can be made by seperating those functions required to administer the Bureau from those required to administer the land.

To illustrate, it appears that -

Bureau administration includes packages such as:

Accounting and Fund Control

Payroll

AWP and Program Management

Property Control and Management

Land Administration includes packages such as:

Resource Inventory

Land Records Management

Case Management

Into which category does one put program planning? EAR/EIS Preparation and Publication? One finding of the Strategic Plan study was that Bureau administration functions are required to perform Land administration functions. Thus it eliminates the functional viability of the integrated system concept if land and bureau administration are seperated. Budget, manpower, equipment and facilities are Bureau resources just as land, minerals, recreation and wildlife are Bureau resources. It would be unnecessarily difficult to manage the wildlife resource without considerable attention to managing the budget and manpower resource.

. Management Control

To make effective use of DOI facility, each agency must conform to the procedures, languages, time schedules, etc. of the computing center. This is much more difficult to accomplish at the Departmental level with the many agencies with different missions and objectives than at the Bureau level where work done is directed at the same missions and objectives.

Other agencies doing our work (alternative B), other agencies doing part of our work (alternative C) or each region/state doing its own (alternative [1]) would each have to be coordinated.

. Effectiveness

A computer operation system designed to effectively meet the majority the requirements of all agency users may not meet all the mission requirements of any one using agency.

The value of using any tool is dependent on the user's knowledge of how that tool should be used. If the user is required to know more than one tool (alternative B & C) the learning process takes longer and limits the flexibility of individuals as they move throughout the Bureau.

Under the centralized Bureau alternative, effectiveness can be measured within the Bureau resources and eliminates the possibility of "passing the buck".

Assuming that ADP should follow program policy and not visa-versa, there is no program reason for consolidating the computing power of several bureaus unless and until there is inter-bureau consolidation of programs.

On the next page these seven considerations are rated for each alternative. The results indicate the Bureau centralized configuration best suits BLM's data processing needs.

(See the issue paper at end of this section for an in-depth explanation of "Centralized Configuration.)

FIGURE 6

COMPARISON OF CONFIGURATION ALTERNATIVES

CONSIDERATIONS \ ALTERNATIVES	a- a DOI Computer Center	b- Contract with other government agencies	c. Mission-oriented in house only*	d. Bureau decentralized configuration	e. Bureau centralized configuration.
Staffing Level	1	1	2	3	2
User Control	3	3	3	1	1
Cost	?	?	3	3	1
ADP Capability	3	3	3	3	1
Workload	3	3	3	3	1
Management Control	3	3	3	3	1
Effectiveness	3	3	3	1	1

1- Advantageous to BLM

2- no impact

3- Disadvantageous to BLM

* Assumes a workable distinction can be made between mission-oriented work and non-mission oriented work.

Equipment Required For The Recommended Alternative (E. Centralized)

Following specific equipment would be required at the various sites
ne centralized recommendation. There are three assumptions being
:

a. That each field site is connected directly via leased and conditioned telecommunication lines do the central processor. This assumption is in lieu of a more economical, telecommunication network that will result from a complex network analysis to be done by the vendor/ manager of our facility.

b. That the equipment listed per site type is at the point of full implementation and is not scaled specifically to localized need. Equipment acquistion per site will be phased according to the Strategic Plan Implementation Schedule (Section IV) and localized need.

That the equipment and numbers of each kind listed on the following table may change as we progress through the implementation schedule. Changes in priorites, directives from the Department, etc. can cause such changes.

FIGURE 7: Centralized Configuration ADP Requirements

SITE TYPE	EQUIPMENT	TOTALS
Central Site (currently DSC)	1 Central Processor	1
	2 Communication Control Units	2
	89 Modems	89
	1 high capacity storage device	1
	7 magnetic tape units	7
	3 chain driven printers	3
	1 card reader	1
	1 card punch	1
	1 CRT console with backup	1
State Office	1 terminal control unit	12
	1 modem	12
	2 graphics terminals with hard-copy option	24
	3 alphanumeric keyboard terminals	36
	1 graphics tablet	12
	1 alphanumeric video terminal with hard-copy option	12
District Office, OCS Office & BIFC	1 terminal control unit	65
	1 modem	65
	1 graphics terminal with hard-copy option	65
	2 alphanumeric keyboard terminals	130
	1 alphanumeric video terminal with hard-copy option	65
	1 graphics tablet	65

SITE TYPE	EQUIPMENT	TOTALS
Washington Office Assistant Directorate and Denver Service Center Divisions	1 terminal control unit	12
	1 modem	12
	1 alphanumeric keyboard terminal	12
	1 alphanumeric video terminal with hard-copy option	12
	1 graphics terminal with hard-copy option*	6
	1 graphic tablet*	6

REMOTE SITE SUMMARY (State, District, CCS, BIFC, WO)

terminal control units	-89
modems	-89
graphics terminal with hard-copy option	-95
graphics tablets	-83
alphanumeric keyboard terminal	-178
alphanumeric video terminals with hard-copy option	- 89

* for appropriate AD's/divisions

Issue Paper:

Clarification of Proposed Equipment Configuration

The draft Strategic Plan for BLM Information Systems and the Report to the Director, dated August 1975, recommend an equipment configuration labeled centralized. Among the alternatives considered this was determined to be the most cost-effective means of getting information processing to the users on a Bureau-wide basis. In the Report to the Director, this configuration is described as one "where most of the computing power is concentrated at a single facility and Bureau offices are hooked to it through some kind of communication lines .....". The objective of this paper is to expand on and clarify this recommendation.

The current Bureau situation in terms of automated information processing support is unbalanced. In cooperation with the state and county government, Oregon State Office personnel are developing an interactive graphics configuration which provides resource managers with one type (graphics) of information for decision making. Alaska State Office also has access to computing power. They have developed applications to support intra-state case file and land status information needs. In both of these cases, the support is not available on a Bureau-wide basis. In contrast to Oregon and Alaska, the other ten states rely almost entirely on the Service Center for automated information processing needs. At this time, the Service Center itself does not have as full a range of data processing capabilities as required.

Just as the current Oregon and Alaska situations are the results of

Date: 26 6/2/75

Issue Paper

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The current Bureau situation in terms of automated information processing support is unbalanced. In cooperation with the state and county governments, Oregon State Office personnel are developing an interactive graphics computing application which provides resource managers with new type (graphical) of information for decision making. Alaska State Office also has access to computing power. They have developed applications to support interactive case file and land status information needs. In both of these cases, the support is not available on a Bureau-wide basis. In contrast to Oregon and Alaska, the other ten states rely almost entirely on the Service Center for automated information processing needs. At this time, the Service Center itself does not have an full range of data processing capabilities as required.

Just as the current Oregon and Alaska situations are the results of

phased growth based on local need, available resources and user acceptance of each phase over time, so must the future Bureau-wide situation be a result of local and Bureau-wide need, available resources and user acceptance over a period of time.

Though the details of our future information processing picture aren't yet firm at this time, it is safe to state two major aspects to the integrated, Bureau-wide growth toward a configuration of terminals and computers successfully providing on-the-ground line and staff with information for decision making.

The first aspect regarding the equipment configuration will include a large computer in the Service Center accessible by all BLM offices that lie within the practical limits of current telecommunications technology. Each office will have information processing services as though the computer in Denver was dedicated to that office. The office will share graphic, statistical and query capabilities as needed within their office. If the Bureau is to effectively integrate data processing and remote sensing in support of Bureau goals on a Bureau-wide basis, this central computer will always be a requirement for

- backup functions
- clearinghouse functions
- a large amount of data storage
- overflow protection
- Bureau-wide processes that are highly batch-oriented and require processing speed which the large computer will offer.

Many of the Bureau's information generating processes involve methods that are common to all offices: URA's and MFP's require generation of certain maps and statistical tables. A main difference in these products from one office to another is the data. The process of handling the data through the computer is the same. The P.D. inventory system is applied to each inventory area with only minor, if any, changes from one inventory area to another. The information processing steps are repeated for each area and the district(s) responsible for an inventory area receive reports, listings and information products that have the same format as other districts, even though the context varies. It is in satisfying these kinds of common processing requirements, where several office can share the same automated process and/or data, that the centralized configuration is recommended.

The second aspect regarding the equipment configuration will provide processing capabilitity to BLM offices as localized need dictates. This will give the user computational power for his unique requirements without affecting the centralized requirements. For example, a percentage of the resource data gathered at a district may not be used anywhere else- even in a summarized format. Since no one else needs this data, it is most practical to store and process it physically in that office. Offices would go about attaining fiscal resources for such localized processing capabilities as they do now. All localized, unique processing support will be developed to fit within the centralized aspect so that should the localized need become Bureau-wide, the localized support can easily be expanded to a Bureau-wide base.

This second aspect has several ADP names - distributed processing, distributed computing, localized processing, down-line processing.

Whatever title is chosen, it implies the placement of equipment with its own computing power at most practical point of need and feasibility to capture and process data at the source.

Centralized processing and localized processing are both necessary for BLM. Certain Bureau functions are more effectively supported centrally while other (local) functions are more effectively supported by a field-level configuration. The determination of which configuration best suits a function will be based on performance - performance of the system must be so that people will use it. If a user needs to manipulate ten million characters of basic resource data on a daily basis, the volume, frequency and limited number of users accessing the data may indicate the need for distributed processing. Each case will be examined in its own merit and how it fits within the overall Bureau framework.

Not all offices will be equally involved in the distributed configuration:

- Program priorities and localized crises may dictate acquisition of a small or mini-computer at one office early in the evolution of our total configuration picture.
- Oregon is already into the localized aspect of the equipment picture because of their unique need for extensive forest management. Integrating Oregon into the Strategic Plan will emphasize alternatives to better service their needs which are Bureau-wide.
- The Energy States may be into the localized support aspect much sooner than the states without such a critical commodity.
- Alaska will likely remain separate from the Bureau's equipment communication network until better methods of communication with

the Lower 48 are available. Alaska will share in the development of the Bureau-wide applications so that if and when it is technologically and financially possible to include them in the Bureau network, their systems may be immediately supported.

The ratio of localized processing to centralized processing will probably be very low initially. Whether the localized aspect grows depends on several factors:

- information obtained from the Detailed Requirement Definition effort regarding data needs including frequency of users, location of users, volumes, etc. These needs will be determined with extensive user participation.
- The impacts of on-site computing power as evaluated by the users.
- advances in ADP technology and telecommunications capabilities that are beneficial to BLM.

3. Alternative Approaches for Obtaining Remote Sensing Capability

Both sensing and analytical capability are needed, as indicated in Part II.

Several alternatives have been considered, including:

- BLM acquire all the equipment needed to meet both sensing and analytical needs.
- Obtain imagery, processed, analyzed and ready to use, entirely from a contractor or another agency, and acquire only limited special purpose interpretation equipment.
- Mixture of above alternatives.

The first alternative is not favored since this would put BLM in the role of developing its own satellite and aerial photography capability - an area where other agencies and contractors are well established and where it would be much more efficient to purchase their sensing capability.

The second alternative is not favored either since this would not permit BLM to develop its own analytical capability, to analyze imagery to obtain the unique data needed for BLM purposes. This second alternative would greatly reduce the flexibility and responsiveness needed to support the user oriented interactive capability desired.

The third alternative is recommended with the imagery being obtained from a contractor or another agency and with BLM acquiring the equipment and developing the capability to do our own analysis.

The remote sensing equipment needed to implement this favored alternative, above and beyond the ADP equipment listed in the preceeding section, includes:

FIGURE 8: Remote Sensing Equipment Requirements

SITE TYPE	EQUIPMENT	TOTALS
Central Site (currently DSC)	Input Scanner	1
	Image Analyzer Console	1
	Image Memory	1
	Graphic Display Terminal	1
	Mini-Computer with 256K memory	1
	Graphics Tablet	1
	Plotter	1
	Digitizer	1

4. Concurrence in Equipment Approach

Concurrence in the recommended ADP and Remote Sensing Equipment approach (provides policy direction for BLM staff to plan configuration and network design using the recommended equipment approach. It also provides policy direction for BLM staff to develop necessary position and policy documents).

Concurrence at this point does not infer that any future position/policy documents are being approved now-such documents will be channeled through the Director on an individual issue basis.

_____ _____

I Concur Date

C. An Organizational Approach to Implementing the Strategic Plan

An adequate organizational structure and suitable operating guidelines to staff and implement the Strategic Plan are needed, if the effort is to be successful. The proposed organization is based on explicit organizational and management criteria which attempts to express the Steering Committee's judgment and assumptions about present and future operating conditions and needs. The criteria and the assumptions used in developing the proposed organization follows:

1. Criteria

- The structure and procedures established initially should have the capacity to adjust and accomodate change in an evolutional way since the Strategic Plan will of necessity be itself dynamic.
- The structure and procedures should provide for adequate and balanced participation by ADP, Remote Sensing, and subject matter personnel.
- The location and structure of each component of the organization should be such that it ensures close and effective program and policy direction and coordination with related Bureau activities.
- The structure should provide for a single high level focal point responsible for the project management of and implementation of the Strategic Plan.
- The organization, priorities given to staffing it and related activities, and procedures developed to implement the Strategic Plan should, in a timely way, provide for the necessary level and mix of skills to support implementation of the plan.

- The organization should make adquate provision for increased participation in interagency coordination and cooperation efforts in areas related to information systems.
- The organization should be designed so that it meshes into normal BLM organizational patterns and functional responsibilities at all levels of the Bureau.
- The organization should be designed so that as the Strategic Plan developes most of the operational effort and emphasis of the core staff can be shifted to subject matter and operational personnel at the Service Center and field office levels.
- The structure should initially be designed to accomodate the use of ad hoc team efforts to accomplish high impact program demands and should not attempt to be totally self contained.

2. Assumptions

- That the Steering Committee concept will continue to be used to provide general guidance to the further development of and implementation of the Strategic Plan.
- That chairmanship of the Steering Committee will continue to be a Directorate level assignment.
- That lead staff responsibility for the project management and program direction to Strategic Plan implementation should be assigned to the Washington Office.
- That the operational aspects of Strategic Plan implementation should be assigned to the Service Center or perhaps special segments to specifically designated field offices.

- That the input into the Strategic Plan of technical requirements from the Bureau's basic disciplines should come from the Service Center level with proper coordination and clearance from the Washington Office technical staffs.

- That the Strategic Plan will give high priority to integration, as soon as possible, no matter what their source or present stage of development.

- That there will be some detached and perhaps somewhat independent ADP efforts which will continue, for an interim period, outside of specific Strategic Plan efforts, but which will generally fall under the overall perview of the plan and be subject to Steering Committee review and approval.

- That once the Strategic Plan is approved that it will receive continuing support from Bureau Management in terms of funding and staffing priority and necessary technical support inputs.

- That there will be heavy involvement and committment from subject matter specialists at all levels of the Bureau to make adequate input into the development of the Strategic Plan on a continuing basis.

- That the development of Remote Sensing capabilities within the Bureau will be directly tied to development and implementation of the Strategic Plan, especially during the initial phases of both.

3. Organizational Recommendations

Various organizational alternatives to implement the Strategic Plan were considered, examined, and analyzed. Based on this analysis and

the conclusions reached in it the following recommendations regarding a proposed organization structure are made:

- That the Steering Committee be reconstituted and that it include one representative from each AD area, at the Division Chief or higher level, plus an executive secretary.
- That the chairman be the Assistant Director, Technical Services.
- That the vice-chairman be the Deputy Assistant Director, Resources.
- That the Executive Secretary be the head of the organizational unit assigned responsibility for implementation of the Strategic Plan.
- That the Steering Committee also function as the Bureau's Executive ADP Review Board.
- That a relatively small organizational unit be established, at the division or comparable level reporting directly to the AD-Technical Services, and assigned responsibility for implementation of the Strategic Plan.
- That this staff initially be made up of the following kinds of skills deemed necessary to properly manage implementation of the Strategic Plan:

  ADP Technical skills
  Remote Sensing skills
  Project Management and systems development skills
  Policy development and inter-agency cooperation skills

- That this staff be identified as having specific responsibility for project management of Strategic Plan implementation and related activities.
- That multi-discipline ad hoc working teams be established at the Denver Service Center as needed to carry out specific segments of

the implementation plan. This might involve the establishment of a permanent coordinator and/or team leadership positions at DSC to insure proper management of this activity, at least for the next few years.

- That an information systems and remote sensing coordinator be designated in each AD's area to serve as the focal point for Stragegic Plan coordination for various diciplines involved, especially with regard to liaison with Service Center and field counter-part staffs.

- Strengthen and/or realign the DSC Division of Data Processing as necessary to accomodate the new emphasis which will be required under the Strategic Plan development activities.

4. Concurrence

Concurrence in the recommended organizational approach commits the Bureau to initiate the recommended organizational changes, and staffing, in the near future. Established Bureau procedures will be used to approve and accomplish the specific actions involved.

_____ _____

I Concur Date

D. Policy For Intergrating Existing ADP Systems

A part of the strategy for implementing the Strategic Plan includes a careful review of existing systems which may be within the scope of the Strategic Plan and of use in the development of application packages. The potential savings of a real effort to locate usable computer programs or parts of programs may be significant if existing computer programs are well documented.

This review will take place during detailed requirement definition and systems design tasks of system life cycle (see Section III.E.). Furthermore, current ADP operational systems will maintained by BLM out of DSC, Oregon, Alaska and other State offices will remain in operation until the application package(s) which replace, modify or include current programs have been accepted by the users and the package(s) implemented at appointed offices. At that time, the current systems which support bits and pieces of a Bureau activity will be phased out as the application package oriented system is phased in.

For systems which are in some stage of development, individual management decisions will be made to continue or postpone that development based on the following considerations:

- the relationship of the development effort to the Strategic Plan priorities
- the extent to which there is established user reliance for products produced
- Bureau priority and criticality for the products to be produced.

E. Necessary Implementation Tasks.

Implementation of the Strategic Plan requires that a great many tasks be carried out. (e.g., necessary training, hardware procurement, development of application packages, checkpoints for management approvals and personnel realignments during the early stages of plan implementation.) It is strategically essential that these tasks be carefully planned and scheduled in a sequence proven successful in other similar system development efforts.

1. System Life Cycle Tasks.

The multitude of tasks to be performed are grouped into a series of standard sequential steps, called the "System Life Cycle," and shown in Figure

By dividing the System Life Cycle into these seven sequential tasks, or building blocks, and including adequate management review points for each task both the user and data processor are able to check development and assure progress.

Primary and secondary responsibilities for these tasks clearly indicates that activity within the System Life Cycle is shared between user and data processing (dp) staff with more user responsibility than dp staff.

FIGURE 9:

System Life Cycle Task	Responsibility	
	Primary	Secondary
1. Strategic Plan	User	DP Staff
2. Detailed Requirement Definition	User	DP Staff
3. System Design	equal	
4. System Development	DP Staff	User
5. Acceptance Testing	User	DP Staff
6. Bureau-wide Implementation	User	DP Staff
7. Operations and Maintenance	User	DP Staff

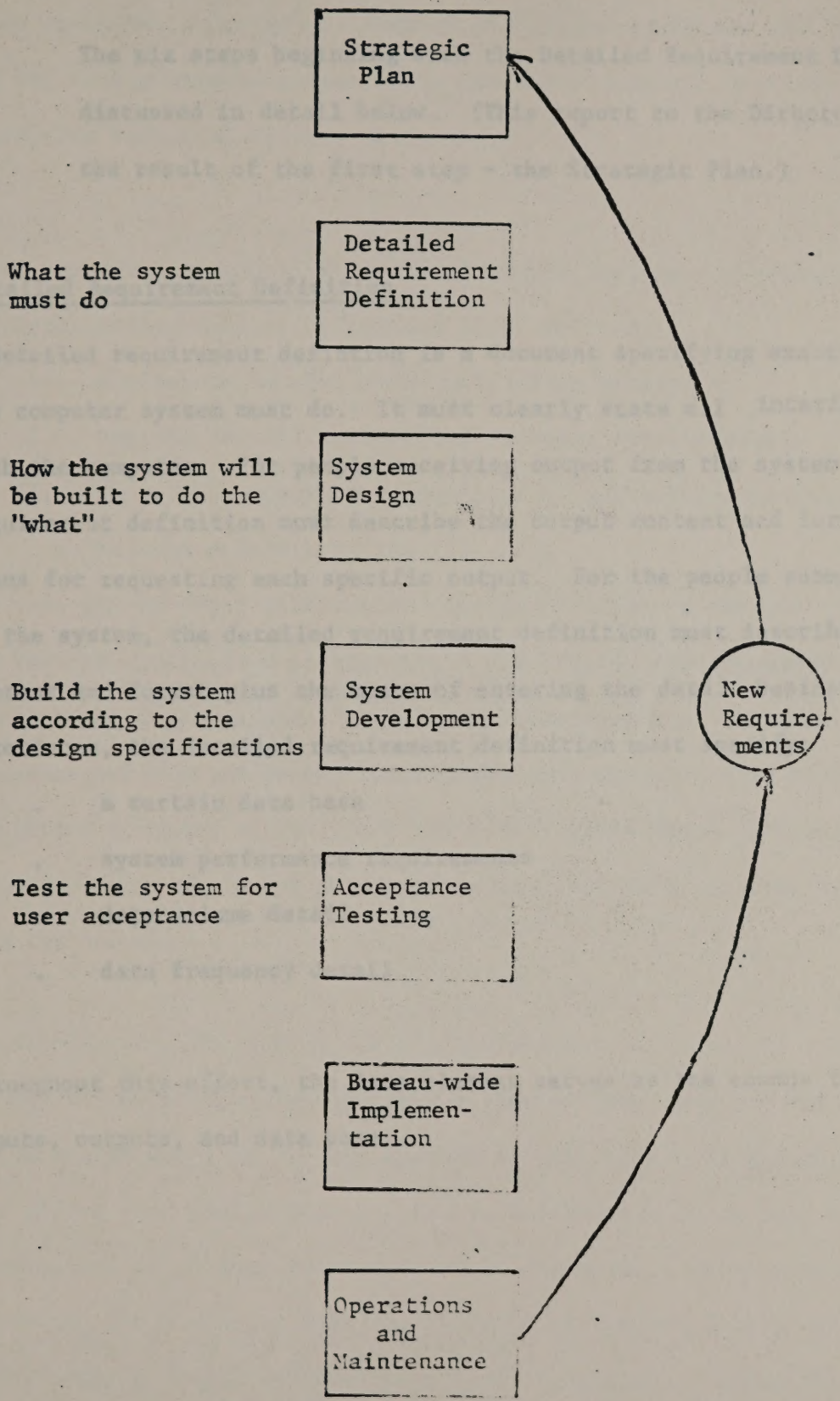
It is critically important that BLM go through this sequence of steps, as outlined in the balance of this section (III.E) if the Strategic Plan is to be successfully implemented.

Guideline percentages are associated with each of these seven steps to show the cumulative degree of commitment and proportional expense per task. These are based upon similar experience in other organizations where long-range plans were successfully implemented. Figure 10 shows that at the end of the Detailed Requirement Definition Task, the Bureau will have reached a 50% degree of commitment and only 25% of the project cost will be committed.

Figure 10: Gradual Bureau Commitment Related to System Life Cycle steps

	Cumulative Degree of Bureau Commit.	Proportional Task Expense	Cumulative Expense
Strategic Plan Concurrence	35%	15%	15%
Detailed Requirement Definition	50%	10%	25%
System Design	70%	15%	40%
System Development	85%	30%	70%
Acceptance Testing	90%	10%	80%
Bureau-wide Implementation	98%	15%	95%
Operations and Maintenance	100%	5%	100%

FIGURE 11 SYSTEM LIFE CYCLE



The six steps beginning with the Detailed Requirement Definition are discussed in detail below. (This report to the Director is, of course, the result of the first step - the Strategic Plan.)

Detailed Requirement Definition

A detailed requirement defintion is a document specifying exactly what the computer system must do. It must clearly state all interfaces with the computer. For people receiving output from the system the detailed requirement definition must describe the output content and format and the means for requesting each specific output. For the people submitting input to the system, the detailed requirement definition must describe the input content and format plus the means of entering the data. Besides personnel interfaces, the detailed requirement definition must specify:

- a certain data base
- system performance requirements
- data volume detail
- data frequency detail

Throughout this effort, the data element serves as the common link among inputs, outputs, and data base.

This document serves as an input to the system designers and, more importantly, is the bridge between system users (marine biologist, forester, realty specialist) and technical systems designers.

There are three alternative levels of effort that were considered for executing the Detailed Requirement Definition (DRD) activity:

1. a seperate DRD for each application package
2. one DRD for all application packages simultaneously
3. three DRD efforts for groupings of application packages based on package priorities (see III. F.)

Analysis of the first alternative pointed out major drawbacks (1) Doing a DRD for one application package would not provide the necessary data base design specifications until the 15th DRD was complete. This would cause an unacceptable delay in our acquisition of a suitable data base-data management software system. (2) The effort would be so long and drawn out that the Bureau would "go to sleep" waiting for some concrete benefits from the effort.

One simultaneous DRD effort for all application packages, if well managed and tightly controlled, would allow a shorter time span for the effort than alternatives 1 or 3. But success of this effort is highly dependent upon strong user participation. The full attention of so many expert personnel representing all Bureau activities would not allow a balance between implementing the Strategic Plan and carrying on current Bureau operations. Furthermore, a single undivisable effort eliminates Management's flexibility in changing development priorities and severly limits Managements' ability to have checkpoints to review the validity of such a significant (in time and money) activity.

By planning for three phases of the DRD the disadvantages described for the other two alternatives are eliminated. The three DRD efforts are currently planned as follows:

1. DRD Phase 1:

   Resource Inventory

   Land Records

   Case Management

   Utilization Management

2. DRD Phase 2:

   Planning - URA

   Planning - MFP

   EAR/EIS Preparation and Publication

   Program Planning

   Regional Analysis

3. DRD Phase 3:

   AWP and Program Management

   Property Control and Management

   Manpower and Organization Management

   Accounting and Fund Control

   Payroll

   Protection

Computer Systems Design

Detailed Requirement definition is followed by system computer design which uses uses the detailed requirement definition as the what-the-system-must-do-and proceeds to define how the system must be built to achieve the what in the most economical way. This requires breaking the DRD down into a series of processing runs and detailing and documenting those runs. The number of runs and the inputs, processes and outputs of each run will depend on such factors as:

- the capacity of the particular hardware configuration (amount of core storage, number of disk and/or tape units available, etc.)
- natural ADP processing segments covering such areas as input conversion, editing, sorting, merging, file updating, etc.
- volume of transactions
- data base organization
- necessary audit trails and control provisions

These are only some of the factors to be considered; the sequence and processes of the various runs often have to be modified and refined until the final systems design is completed.

Computer Systems Development

System design documents are handed over to computer programmers for system development. This part of the system life cycle is where computer programs are coded, debugged tested individually and as they interact and depend on each other.

Acceptance Testing and Bureau-Wide Implementation

Once the computer programs have been debugged to the professional satisfaction of the technical systems and programming peronnel, they must then be debugged to the professional satisfaction of the end-users. This is called acceptance testing.

Acceptance testing is the period of time required for the users (or user representatives) to agree that the system satisfies their requirements. The goal here is to obtin user sign-off so that the system can be considered operational (whereas the goal of system testing (in the System Development phase) was to check that modules, documentation, design and system objectives were all compatible). This task is similar to a pilot study. Once the pilot study has been given Bureau approval, a Bureau-wide system implementation schedule can begin. Implementation and the length of time for it are management decisions.

Operations and maintenance

Once an application is successfully phased in, it does not follow that it will remain unchanged. Experience has shown the need for and value of making periodic computer program changes. Some of the more common reasons are

- need for additional output information
- desire for change in input or output formats
- new or absoleted policies, directives
- changes in ADP or remote sensing state-of-the-art
- desire to increase the scope of an application
- realization that computer program results input requirements are not acceptable

Some of the other important jobs in this maintenance include keeping documentation current, keeping data processing schedules, and operating the computer facility.

Checkpoints for management review are critical. Portions of the plan implemented to date must be reviewed in order to assure management that objectives are being met. Future schedules are developed and reviewed to obtain necessary approvals to continue.

2- Long Range Schedule of Tasks, Based Upon System Life Cycle

On the following pages, the Long-Range Schedule of Tasks are presented in a modified GANTT format. Each of the tasks is titled and identified with a key number. A narrative description of each activity is included in Appendix 1 of this report. The Long-Range Schedule of Tasks is divided into three phases in accordance with three phases of the recommended Detailed Requirement Definition Step (page 66). Each of the three phases is consistent with the System Life Cycle Tasks concept (excluding Task I which is the Strategic Plan and which is already prepared). Phase I also contains certain one-time activities which will not be repeated in Phases II or III including:

- Equipment Procurement Tasks - Task 3 - 6
- Personnel and (re-) Organizational Activities - Tasks 1 through 6.
- Initial Strategic Plan Briefing and Training Activities - Tasks 10 through 12.

Phase I includes the one-time tasks mentioned above and tasks associated with the Systems Life Cycle Tasks needed to implement the Resource Inventory, Land Records, Case Management and Utilization Management application packages.

Depending on available Bureau resources and management decision (not required until a review of Phase I progress assures management that commitment should be furthered), Phase II may be initiated. This phase includes tasks associated with System Life Cycle Tasks needed to implement URA, MTP, EAR and HIS Publication and Preparation, Program Planning and Regional Analysis application packages.

The initiation of Phase III depends on the same factors as Phase II and includes System Life Cycle tasks for AWP and Program Management, Property Control and Management, Manpower and Organization Management, Accounting and Fund Control, Payroll and Protection.

This Long-Range schedule of tasks is somewhat flexible. Certain of the tasks could be deleted without major impact to the Strategic Plan. Certain of the tasks could be replaced with an alternative that could bring full Strategic Plan implementation sooner or stretch it out so that costs are lower per year. Certain of the tasks could be moved to another position in the schedule given changes in Bureau program priorities. These characteristics are indicated for each task on the Long-Range Schedule Tasks Characteristics chart.

LONG-RANGE SCHEDULE TASK CHARACTERISTICS

NG RANGE SCHEDULE TASK	Deletion W/out Major Impact	Alternative Possbility	Schedule change Possbility	Key Numb
up Strategic Plan implementation team	NO	NO	NO	1
ion Classification	NO	NO	YES	2
tion approval and staffing	NO	NO	YES	4
lish necessary reorganizations	NO	YES	YES	5
op and approve Project Management Guide	NO	NO	NO	6
u-wide organizational procedures and icies - Phase I	NO	YES	NO	7
tisement	NO	NO	YES	3
u-wide organizational procedures and cies - Phase II	NO	YES	NO	8
au-wide organizational procedures and olicies - Phase III	NO	YES	NO	9
out briefing schedules and formats	NO	NO	NO	10
e Director & W.O. Briefings	NO	YES	NO	11
olish various levels of user training sions and schedules	NO	NO	YES	12
au-wide training for users	NO	NO	NO	13
nical training for systems designers d developers	NO	YES	NO	14
nical training for remote sensing	NO	YES	YES	15
racting plans for DRD - Phase I	NO	YES	YES	16
iled Requirement Definition - LR, RES, CM	NO	YES	YES	17
racting plans for systems design and elopment	NO	YES	YES	18
ems design for Group 1	NO	YES	YES	19
ems development - LR	NO	NO	YES	20
ems Development - CM	NO	NO	YES	21

GE SCHEDULE TASK	Deletion W/out Major Impact	Alternative Possbility	Schedule change Possbility	Key Number
n development - RI	NO	NO	YES	22
n development - UM	NO	NO	YES	23
tance testing - LR	NO	NO	YES	24
tance testing - CM	NO	NO	YES	25
tance testing RI	NO	NO	YES	26
tance testing - UM	NO	NO	YES	27
in LR Application	NO	NO	YES	28
in CM Application	NO	NO	YES	29
in RI Application	NO	NO	YES	30
in UM Application	NO	NO	YES	31
Records Data Capture	NO	NO	NO	32
File Data Capture	NO	NO	NO	33
rce Inventory Data Capture	NO	NO	NO	34
out current production systems	NO	NO	YES	35
pment procurement activity	NO	YES	NO	36
time for equipment installation	NO	NO	NO	41
ersion on new equipment	NO	YES	NO	42
ase B5500	NO	NO	NO	47
d site configuration procurement ivity	NO	NO	NO	48
rations & Maintenance	NO	NO	NO	51
racting Plan for Detailed Requirement nition - Phase II	depends on activity 17	YES	YES	52
iled Requirement Definition - URA, , EIS, PP, RA	NO	YES	YES	53
nical training for designers and elopers	Depends on activity 14	YES	NO	54

ANCE SCHEDULE TASK	Deletion W/out Major Impact	Alternative Possibility	Schedule change Possibility	Key Numbe
ems design for Group 2 packages	NO	NO	YES	55
ems development - URA	NO	NO	YES	56
ptance tssting - URA	NO	NO	YES	57
e in URA Application	NO	NO	YES	58
ems development Regional Analysis	NO	NO	YES	59
ptance Tesing - Regional Analysis	NO	NO	YES	60
e in Regional Analysis application	NO	NO	YES	61
em development - MFP	NO	NO	YES	62
ptance testing - MFP	NO	NO	YES	63
e in MFP application	NO	NO	YES	64
em development - EAR & EIS	NO	NO	YES	65
ptance testing - EAR & EIS	NO	NO	YES	66
e in EAR & EIS Application	NO	NO	YES	67
em development - Program Planning	NO	NO	YES	68
ptance Testing - Program Planning	NO	NO	YES	69
e in Program Planning application	NO	NO	YES	70
data conversion effort	NO	NO	NO	71
onal Analysis data conversion	NO	NO	NO	72
& EIS cataloging	NO	NO	NO	73
data conversion effort	NO	NO	NO	74
ram Planning data conversion	NO	NO	NO	75
Proposal and Commitment	NO	NO	YES	76
te sensing equipment procurement	Depends on activity 76	YES	YES	77
racting Plans - Detailed Requirement nition Phase III	NO	YES	YES	78
AWP, PCM, AFC, MOM, PAY, AND PRO	NO	YES	YES	79

NGE SCHEDULE TASK	Deletion W/out Major Impact	Alternative Possbility	Schedule change Possbility	Key Numbe
n Design for Group 3 packages	NO	NO	YES	80
ns development - Payroll	NO	NO	YES	81
ance testing- Payroll	NO	NO	YES	82
in Payroll application	NO	NO	YES	83
ns development - AFC	NO	NO	YES	84
ance testing - AFC	NO	NO	YES	85
in AFC application	NO	NO	YES	86
ns development - PCM	NO	NO	YES	87
ance Testing - PCM	NO	NO	YES	88
in PCM application	NO	NO	YES	89
n development - AWP	NO	NO	YES	90
ance testing - AWP	NO	NO	YES	91
in AWP application	NO	NO	YES	92
n development - MOM	NO	NO	YES	93
ance testing - MOM	NO	NO	YES	94
in MOM application	NO	NO	YES	95
n development - PRO	NO	NO	YES	96
tance testing - PRO	NO	NO	YES	97
in PRO application	NO	NO	YES	98
ata conversion	NO	NO	YES	99
ata conversion	NO	NO	YES	100
ata conversion	NO	NO	YES	101
ata conversion	NO	NO	YES	102
ata conversion	NO	NO	YES	103
out current PAY-related systems	NO	NO	YES	35

	Deletion M/Or	Dependency	Schedule change?

LARGE SCHEDULE TASK	Deletion W/out Major Impact	Alternative Possbility	Schedule change Possbility	Key Number
out current AWP related systems	NO	NO	YES	35
out current MOM related systems	NO	NO	YES	35

3 - Concurrence

Concurrence in the recommended Implementation commits the Bureau to (1) following the basic system life cycle approach and (2) using a three phase approach consistant with the priorities established for implementing the application packages. The specific applications described and the type schedule outlined will be used, subject to refinement over time.

_____ _____

I Concur Date

F. Application Package Priorities

The BLM Steering Committee for Information Systems has assigned development priorities to the 15 application packages as follows:

FIGURE 15: Application Package Priorities

PACKAGE	PRIORITY
Resource Inventory (RES)	1
Land Records Management (LRM)	1
Case Management (CM)	2
Utilization Management (UM)	2
Planning - URA (URA)	3
Planning - MFP (MFP)	3
EAR/EIS Preparation & Publication (EIS)	4
Program Planning (PP)	5
Regional Analysis (RA)	6
AWP & Program Management (AWP)	7
Property Control & Management (PCM)	8
Manpower & Organization MGT. (MOM)	9
Accounting & Fund Control (AFC)	10
Payroll, (PAY)	11
Protection (PRO)	12

This ranking is based on current and forseeable program priorities and natural work relationships - i.e. resource inventory must precede compilation of a URA.

1 - Rationale For the Package Priorities

Land Records Management processes and data are the basis for all land management jobs. Resources on the land must identified so that land management jobs and goals can be laid out. These two packages have, therefore, received the highest priority.

Case Management and utilization management application packages support basic Bureau operations (e.g. realty and minerals transaction utilization decisions). Having established support for land and resource inventories, these two packages are the next logical priority.

The process of utilization decision-making requires advance planning; development and implementation of the URA and MFP packages will support this planning function. Before finalizing any utilization decisions, EAR/EIS preparation and publication processes must be performed.

Finalized utilization decisions are defined and communicated through Program Planning of which Regional Analysis of a major component.

The next priority is support for executing and monitering utilization decisions. The last packages support the functions involved.

Protection was placed last since it will be "automatically" developed once all the other packages are operational.

Another reason for the lower priorities to PCM,MOM,AFC, PAY and PRO is that these applications already make use of computer technology. Though it may be inadequate, it is father along than the other applications. Hence, it was agreed to emphasize those areas currently lacking ADP and remote sensing support.

1 - Rationale for the Package Priorities

Land Records Management resources and data are the basis for all land management jobs. Resources on the land must identified so that land management jobs and goals can be laid out. These two packages have, therefore, received the highest priority.

Case management and utilization management application packages support basic bureau operations (e.g. realty and minerals transaction utilization decisions). Having established support for land and resource inventories, these two packages are the next logical priority.

The process of utilization decision-making requires, whenever planning development and implementation of the LRA and LCP packages will support this planning function. Before finalizing any utilization decision, RMP/EIS preparation and publication processes must be performed.

Finalized utilization decisions are defined and circumscribed through the Planning of which Regional Analysis of a major component.

The next priority is support for executing and monitoring utilization decisions. The last package supports the functions involved.

Protection was placed last since it will be "automatically" developed once all the other packages are operational.

Another reason for the lower priorities to PCC,MMS,AFS, DA and PPS is that these applications already make use of computer technology. Though in inadequate, it is farther along than the other applications. Hence, it was f
to emphasize those areas currently lacking ADP and provide needing support.

2- Concurrence

Concurrence in the recommended application package priority will be needed as a guideline for all future planning and scheduling related to implementation of the Strategic Plan. Since implementation efforts will be misguided if these priorities are not correct, a substantial committment should be reflected in this concurrence.

_____ _____

I concur Date

IV - IMPLEMENTATION SCHEDULE AND COST ANALYSIS

A - Long Range Alternatives and Total Cost

Part III identified over 100 activities that need to be undertaken, in a carefully designed sequence, to achieve implementation of the Strategic Plan. These activities can be taken as rapidly as physically and organizationally possible, or over a very long time period, depending upon the answer to several policy questions including:

- how much annual cost can or does BLM want to incur
- for how long a period does BLM want to be in a state of transition.

To help provide a basis for dealing with these questions, two alternative implementation schedules have been prepared and costed out.

- A 7-year schedule is presented, which is about as fast as the Strategic Plan could be implemented, considering a variety of constraints, but with all the fund commitment needed.
- A 12-year schedule is also presented. This is somewhat arbitrary, but represents as long a period as would be practical for the implementation effort, considering how long BLM would want to remain in a transition stage.

Annual costs are estimated and tabulated for each of these alternative schedules. This is the first time the cost of implementing the Strategic Plan has been shown, so the Directorate will want to consider these estimates before concurring in any aspect of the Strategic Plan.

Costs are shown separately for:

- Investment (This includes all hardware. The basis for these estimates is shown on page 94)
- System Design (including capturing sufficient data into the systems to insure that they are operative. Tabulated by application package)
- Operations (including the current base of operation cost not being incurred for existing systems)
- Initial gathering and deposition of information into the system. The major item in this cost category is for resource inventory using remote sensing technology. While this cost is not part of the actual system design and implementation cost, it must be faced at this time. It would be somewhat meaningless to install an automated information system to serve management needs and then not spend the additional funds necessary to generate information and place it in the system. These costs are also shown over 7 and 12-year alternative periods. But it should be recognized that a long range program could be designed using the 7-year system implementation alternative and the 12-year information collection alternative, or other similar alternatives.

The following tables and graphs display the two alternatives. The hardware cost estimate schedule reflects these factors.

FIGURE 16: STRATEGIC PLAN COST ANALYSIS

Seven Year Implementation

(Cost per fiscal year in 1,000's)

Item	FY76	FY77	FY78	FY79	FY80	FY81	FY82
I. SYSTEM IMPLEMENTATION							
A. Investment							
1. Hardware (ADP&RS)							
a. Denver	900	700	1161	1661	1161	1161	
b. State Off.	38	303	404	404			
c. District Off.	24	24		860	1720	1750	860
d. OCS Offices		86	86	86	86		
e. BIFC					86		
f. Washington D.C.		70				226	
TOTAL HARDWARE	962	1183	1651	3011	3053	3137	860
B. System Design[1]							
1. Resource Inv.		165	539[2]				
2. Land Records		99	377[2]				
3. Case Mgmt.	132	438[2]					
4. Utilization Mgt.	116	379[2]					
5. U.R.A.				250	130[2]		
6. M.F.P.				250	130[2]		
7. EAR/EIS				250	130[2]		
8. Program Planning				250	130[2]		
9. Regional Analysis					125	125[3]	
10. A.W.P.					125	125[3]	
11. Property						125	125[3]
12. Manpower						125	125[3]
13.Protection							167[3]
14. Payroll							167[3]
15. Accounting							167[3]
16. Bureau Manuals	45						
TOTAL DESIGN	293	1081	916	1000	770	500	751
TOTAL INVESTMENT	1255	2264	2567	4011	3823	3637	1611
II. OPERATIONS							
A. Teleprocessing		19	118	208	298	388	478
B. Oper. & Mtce.	3381	4000	4000	4000	4000	4000	4000
TOTAL OPERATIONS	3381	4019	4118	4208	4298	4388	4478
GRAND TOTAL	4636	6283	6685	8219	8121	8025	6089
LESS BASE	4002	4000	4000	4000	4000	4000	4000
NET ADDED COST	634	2283	2685	4219	4121	4025	2089

1. Cost figures for long range planning only and not for budget purposes-based on 1975 dollars.

FIGURE 17: STRATEGIC PLAN COST ANALYSIS Twelve Year Implementation

(Cost per fiscal year in 1,000's)[1]

ITEM	FY76	FY77	FY78	FY79	FY80	FY81	FY82	FY83	FY84	FY85	FY86	FY87
I. SYSTEM IMPLEMENTATION												
A. Investment												
1. Hardware (ADP&RS)												
a. Denver	900	700	465	465	465	965	465	465	465	465	465	46
b. State Off.	38	139	303	404	303							
c. District Off.	24	24				516	516	516	1806	1806		
d. OCS Offices		86	86	86	86							
e. BIFC						86						
f. Washington,D.C.		70					226					
TOTAL HARDWARE	962	1019	854	955	854	1567	1207	981	2271	2271	465	46
B. System Design[1]												
1. Resource Inv.				165	539[2]							
2. Land Records	99	377[2]										
3. Case Mgmt.		132	438[2]									
4. Utilization Mgmt.		116	379[2]									
5. U.R.A.				250	130[2]							
6. M.F.P.				250	130[2]							
7. EAR/EIS					250	130[2]						
8. Program Planning					250	130[2]						
9. Regional Analysis						125	125[3]					
10. A.W.P.						125	125[3]					
11. Property						125	125[3]					
12. Manpower						125	125[3]					
13. Protection								167[3]				
14. Payroll								167[3]				
15. Accounting								167[3]				
16. Bureau Manuals	45											
TOTAL DESIGN	144	625	817	665	1299	760	500	501	---	---	---	---
TOTAL INVESTMENT	1106	1644	1671	1620	2153	2327	1707	1482	2271	2271	465	465
II. OPERATIONS												
A. Teleprocessing		19	71	121	172	223	274	325	401	478	478	478
B. Oper. & Mtce.	3381	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
TOTAL OPERATIONS	3381	4019	4071	4121	4172	4223	4274	4325	4401	4478	4478	4478
GRAND TOTAL	4407	5663	5742	5741	6325	6550	5981	5807	6672	6749	4943	4943
LESS BASE	4002	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
NET ADDED COST	485	1663	1742	1741	2325	2550	1981	1807	2672	2749	943	943

1. Cost figures are for long range planning only and are not to be used for budget purposes. Based on 1975 dollars.
2. Includes enough data gathering to test the system.
3. Data gathering costs included in operation and maintenance.

FIGURE 1[illegible]:

INITIAL COLLECTION AND DEPOSITION OF INFORMATION INTO THE SYSTEM

ITEM	Acres (1000)	COST (1000)	TIME FRAME	COST/ YEAR	COSTS BY FISCAL YEAR ACCORDING TO 7 & 12 YEAR SCHEDULES ($1000s)															
					FY 78		FY 79		FY 80		FY 81		FY 82		FY 83		FY 84		FY 85	FY 86
					7 yr	12 yr	7 yr	12 yr	7 yr	12 yr	7 yr	12 yr	7 yr	12 yr	7 yr	12 yr	7 yr	12 yr	12 yr	12 yr
RESOURCE INVENTORY 1/																				
1. Min/Geol.	3900	3746	3 yr	1249			1249		1249		1249	1249		1249		1249				
2. Soils	33000	33730	6 yr	5622			5622		5622		5622	5622	5622	5622	5622	5622	5622	5622	5622	5622
3. Vegetation	33000	990	6 yr	165			165		165		165	165	165	165	165	165	165	165	165	165
4.Commercial Tim.	9000	32	3 yr	11			11		11		11	11		11		11				
5. Recreation	3900	3802	3 yr	1267			1267		1267		1267	1267		1267		1267				
6. Visual Resources	481	966	3 yr	322			322		322		322	322		322		322				
7. Rec. Vis. Use	2/	1284	3 yr	428			428		428		428	428		428		428				
8. Archeology	2/	1814	3 yr	605			605		605		605	605		605		605				
9. Historical	2400	2526	3 yr	842			842		842		842	842		842		842				
10. Wildlife	2/	16846	4 yr	4212			4212		4212		4212	4212	4212	4212		4212		4212		
LAND RECORDS 3/		620	2 yr	310		310	310	310	310											
CASE FILES 3/		108	2 yr	54	54		54	54		54										
PLN MANUALS 3/		14	1 yr	14	14	14														
METEROLOGICAL STATIONS 4/		557	5 yr	112	112	112	112	112	112	112	112	112	112	112						
		67035			180	436	15199	476	15145	166	14835	14835	10111	14835	5787	14723	5787	9999	5787	5787
Present Annual Expenditure					2500		2500		2500		2500		2500		2500		2500		2500	2500

1/ Represents new data gathering efforts.
2/ Not available.
3/ Represents capturing already existing data.
4/ Installation of data collection platforms
All costs are for long range planning only and are not to be used for budget purposes.

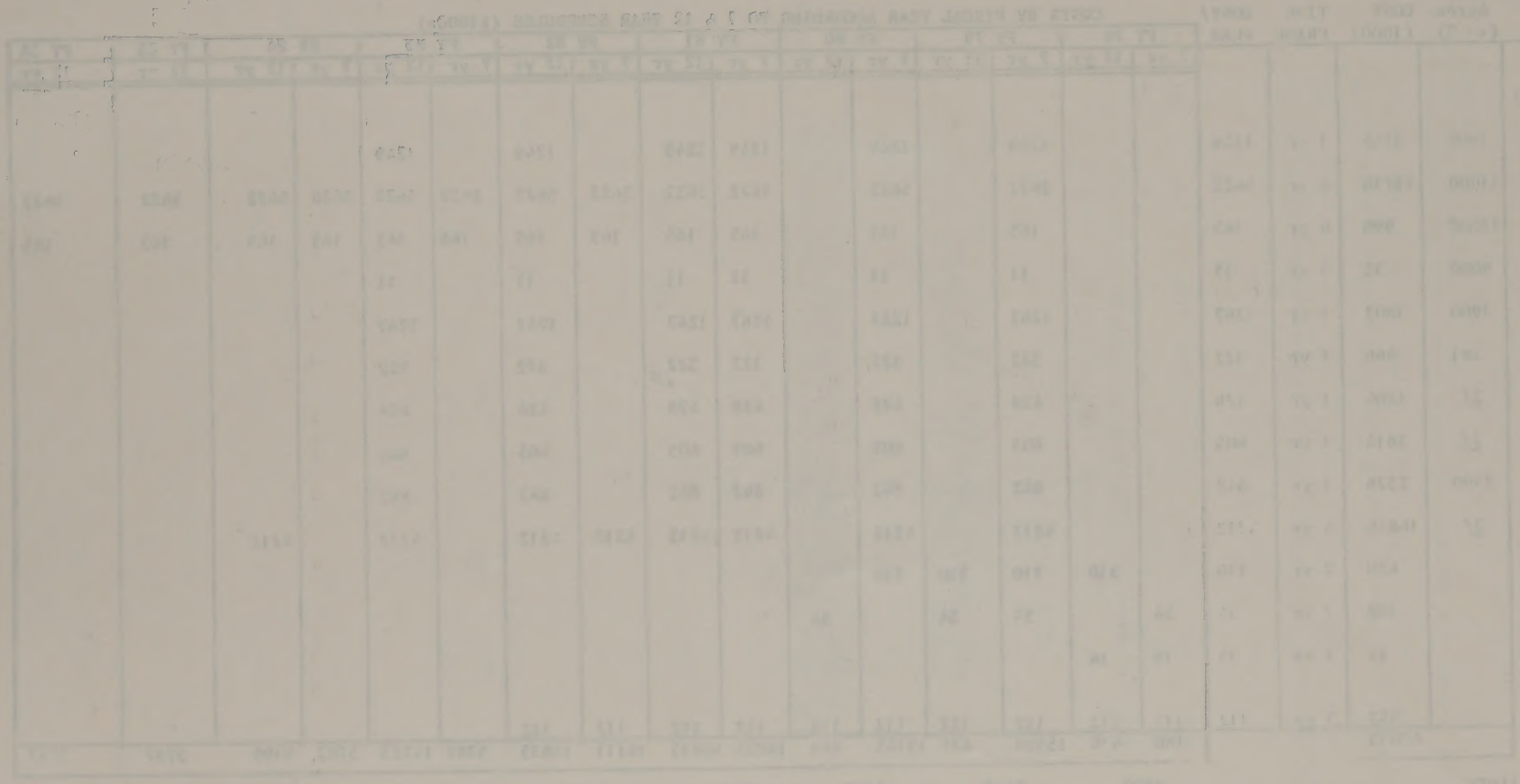
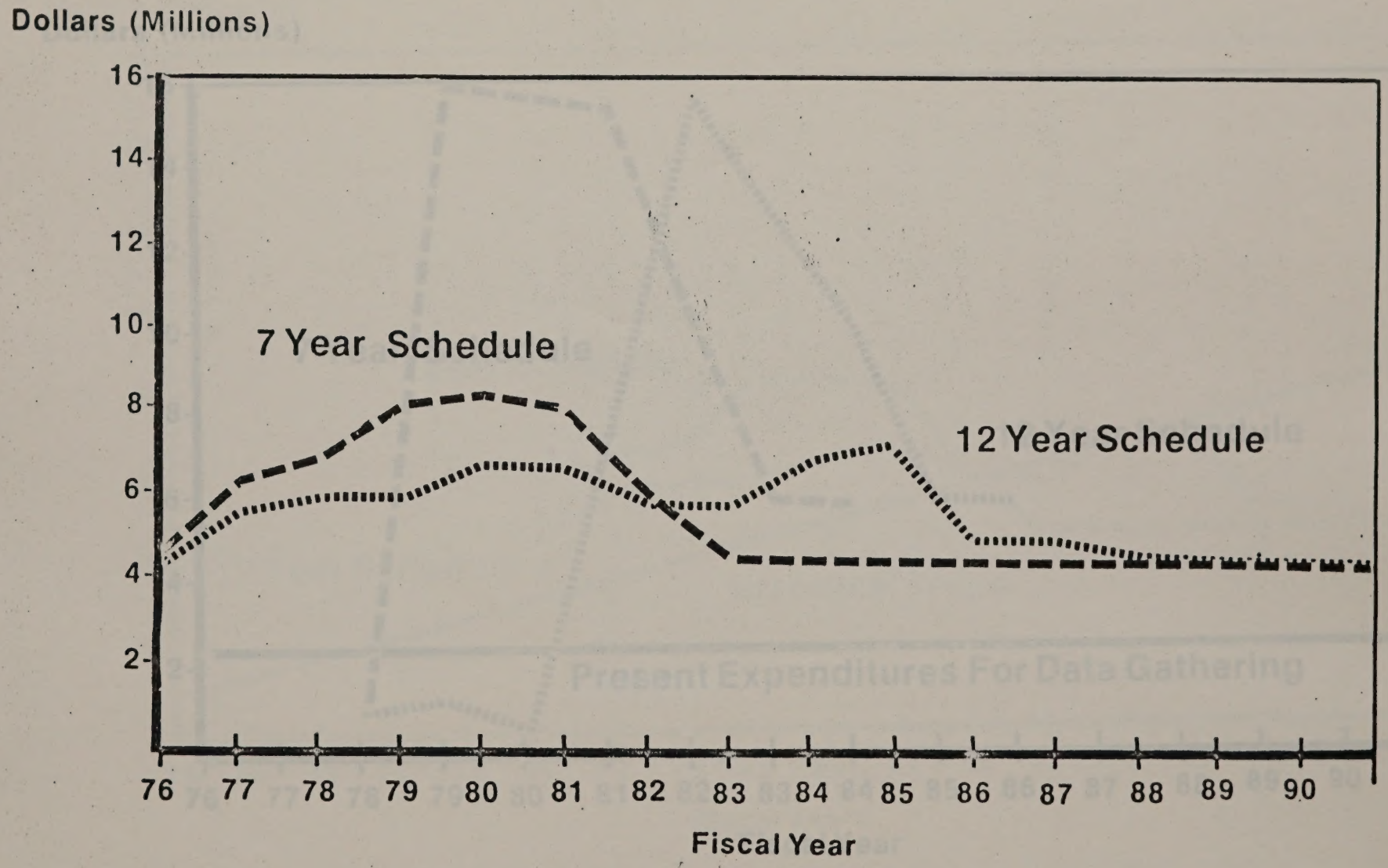


FIGURE 19:

Long Range Alternatives & Total Cost



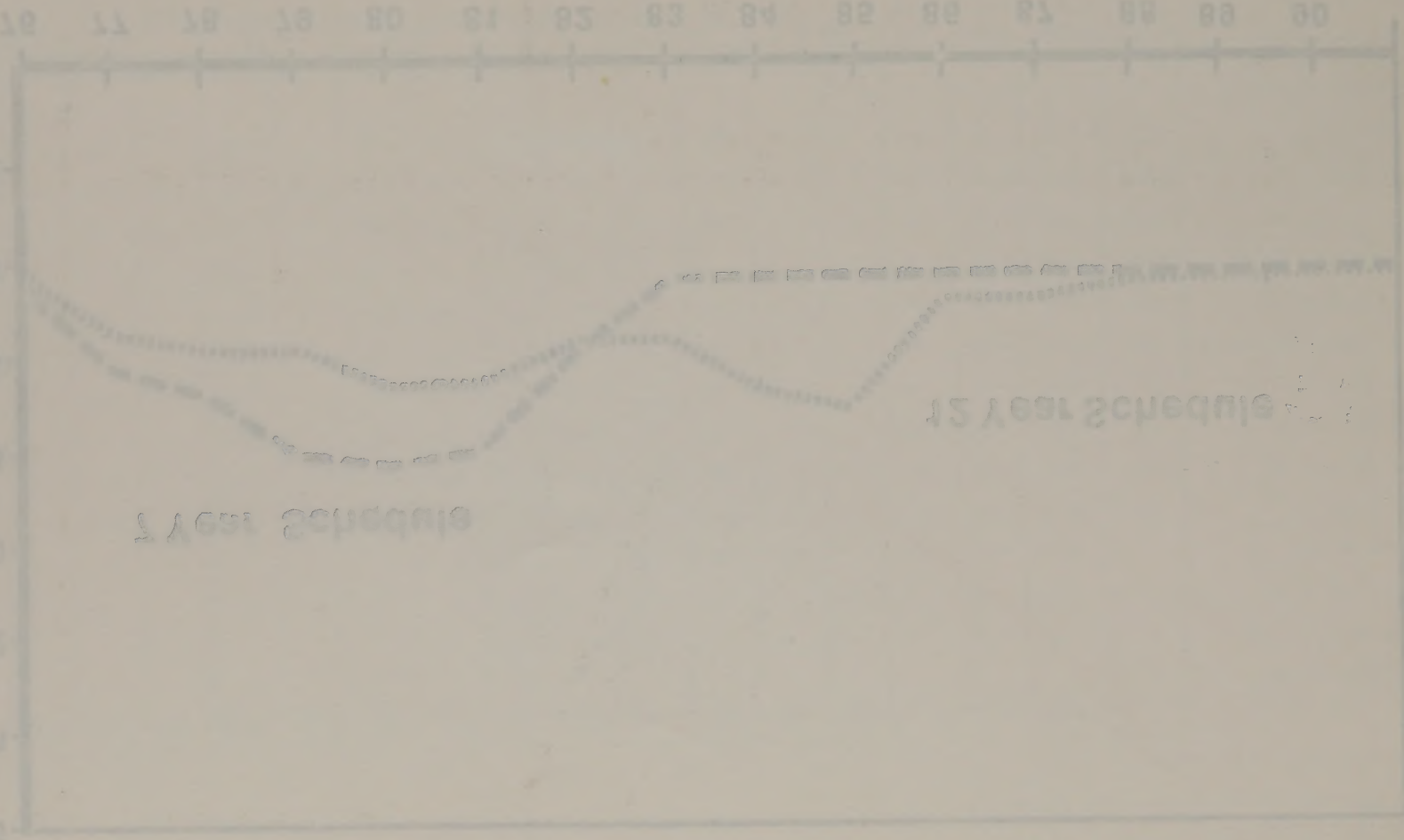
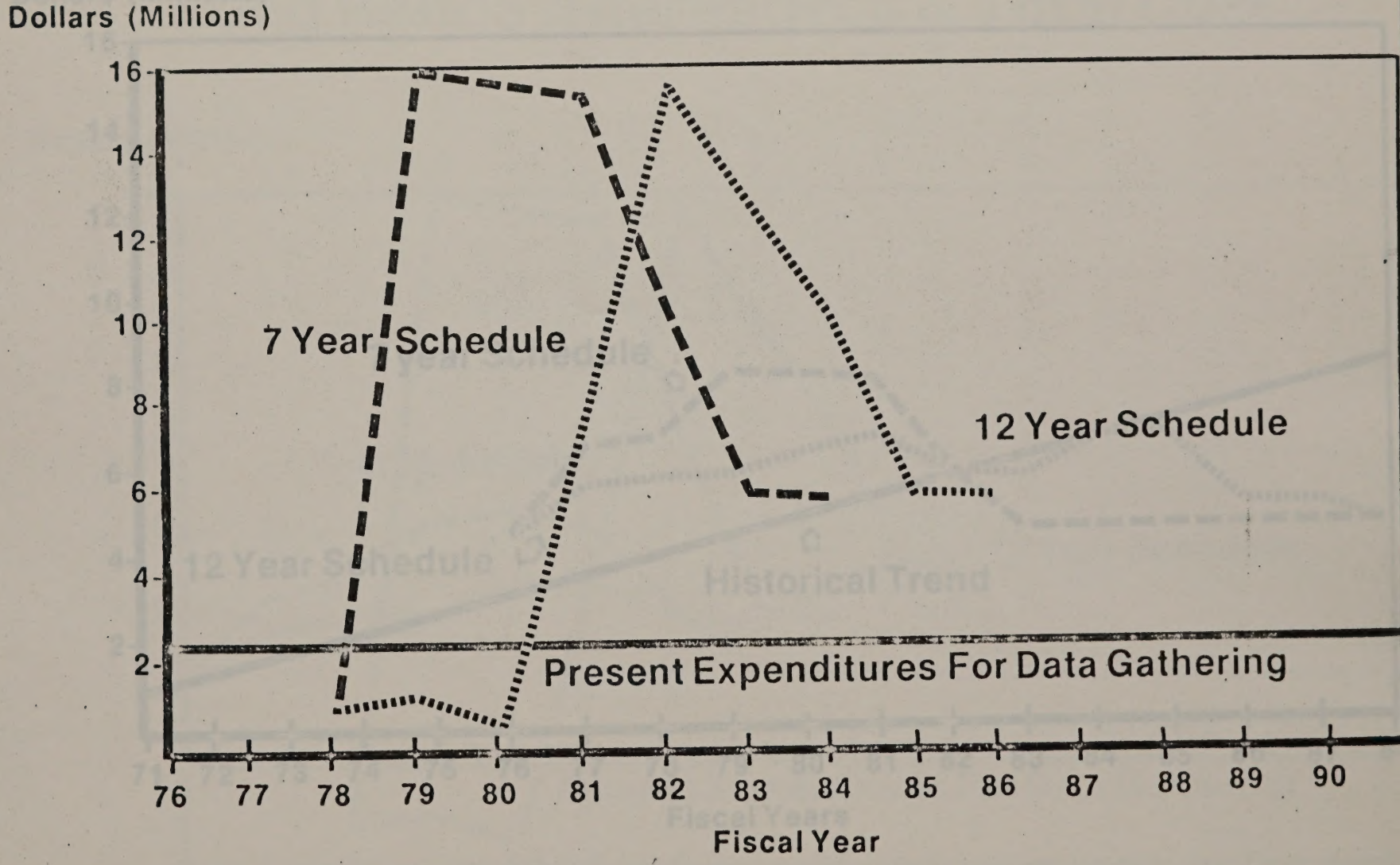
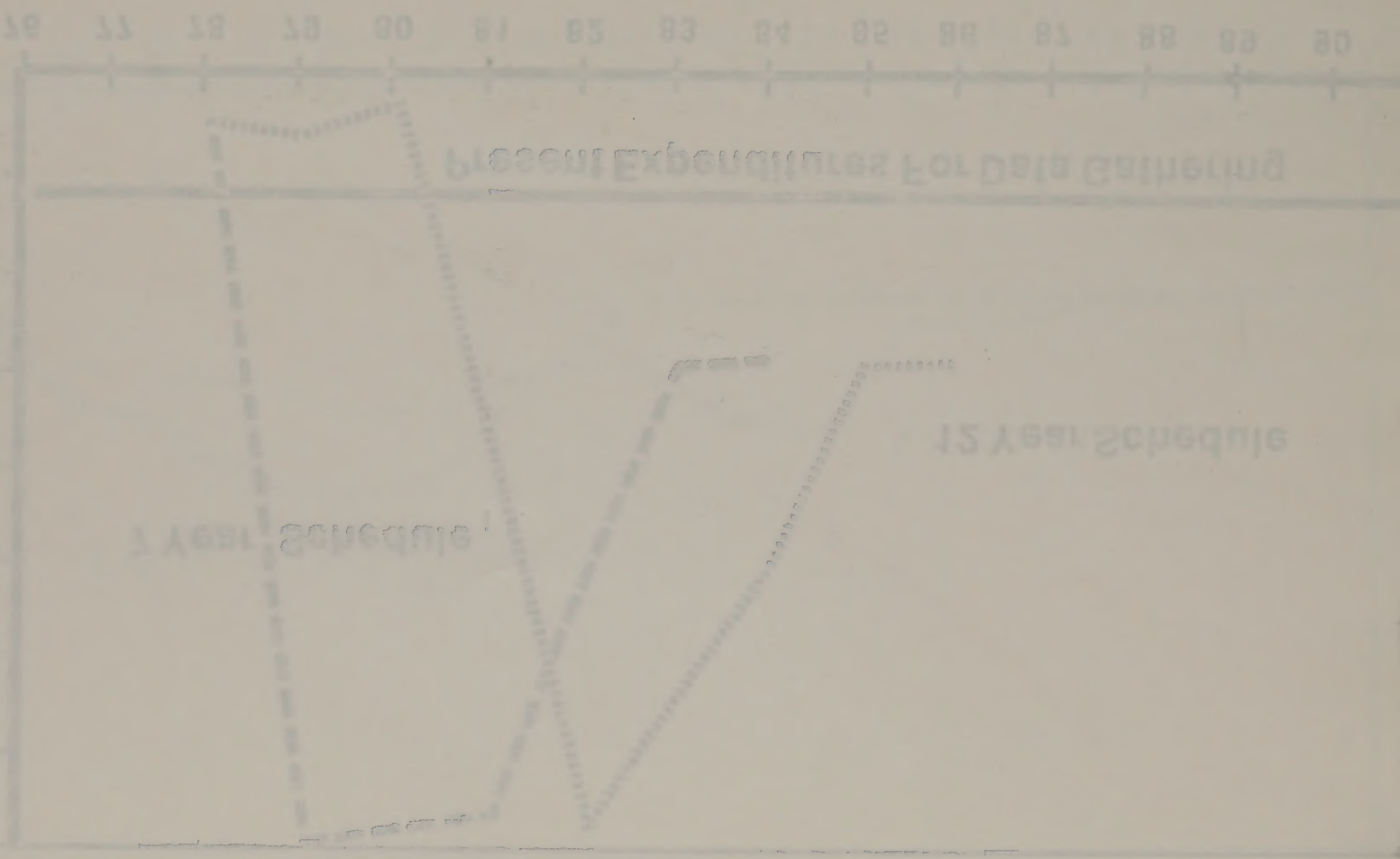


FIGURE 20:

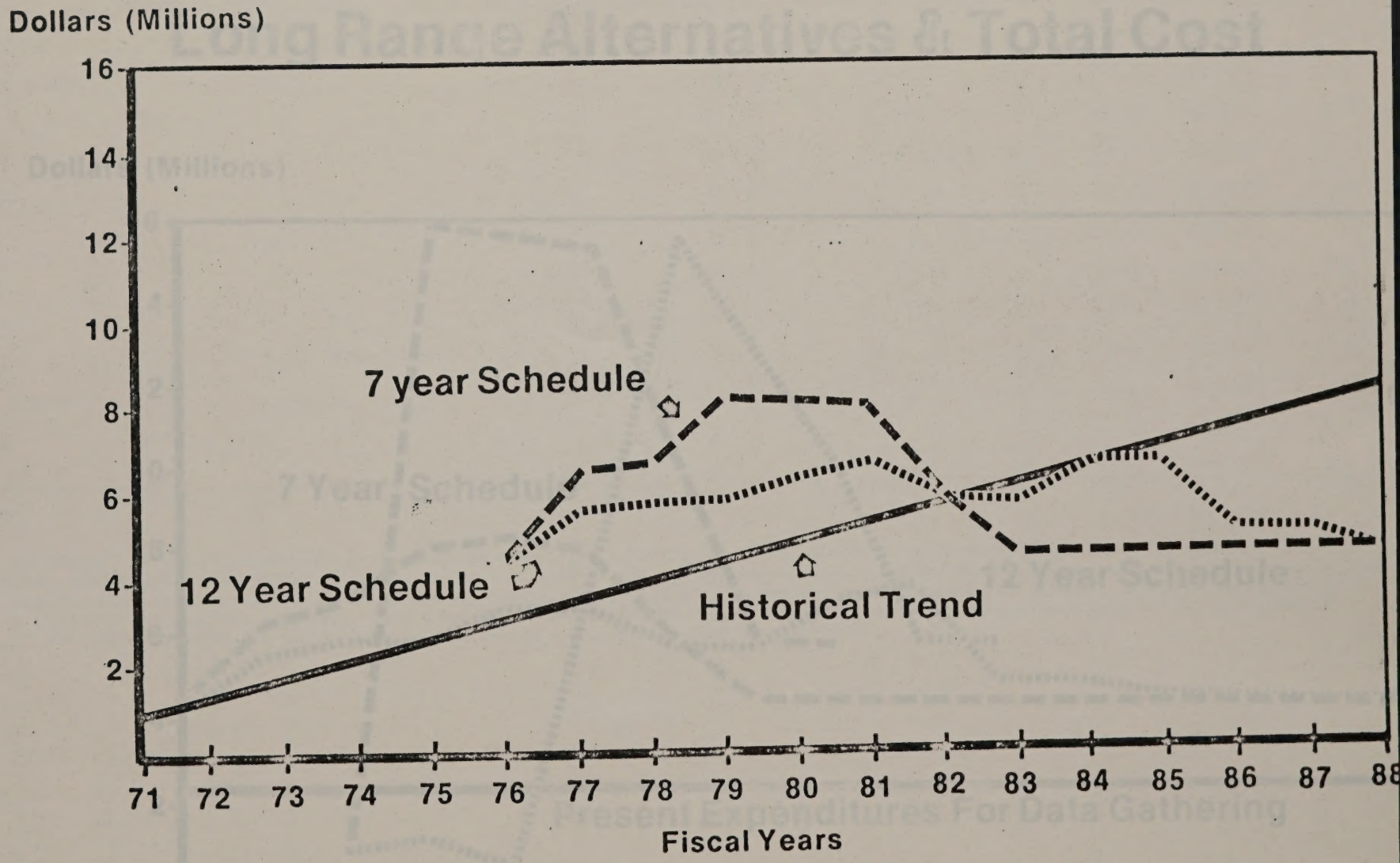
Long Range Alternatives & Total Cost

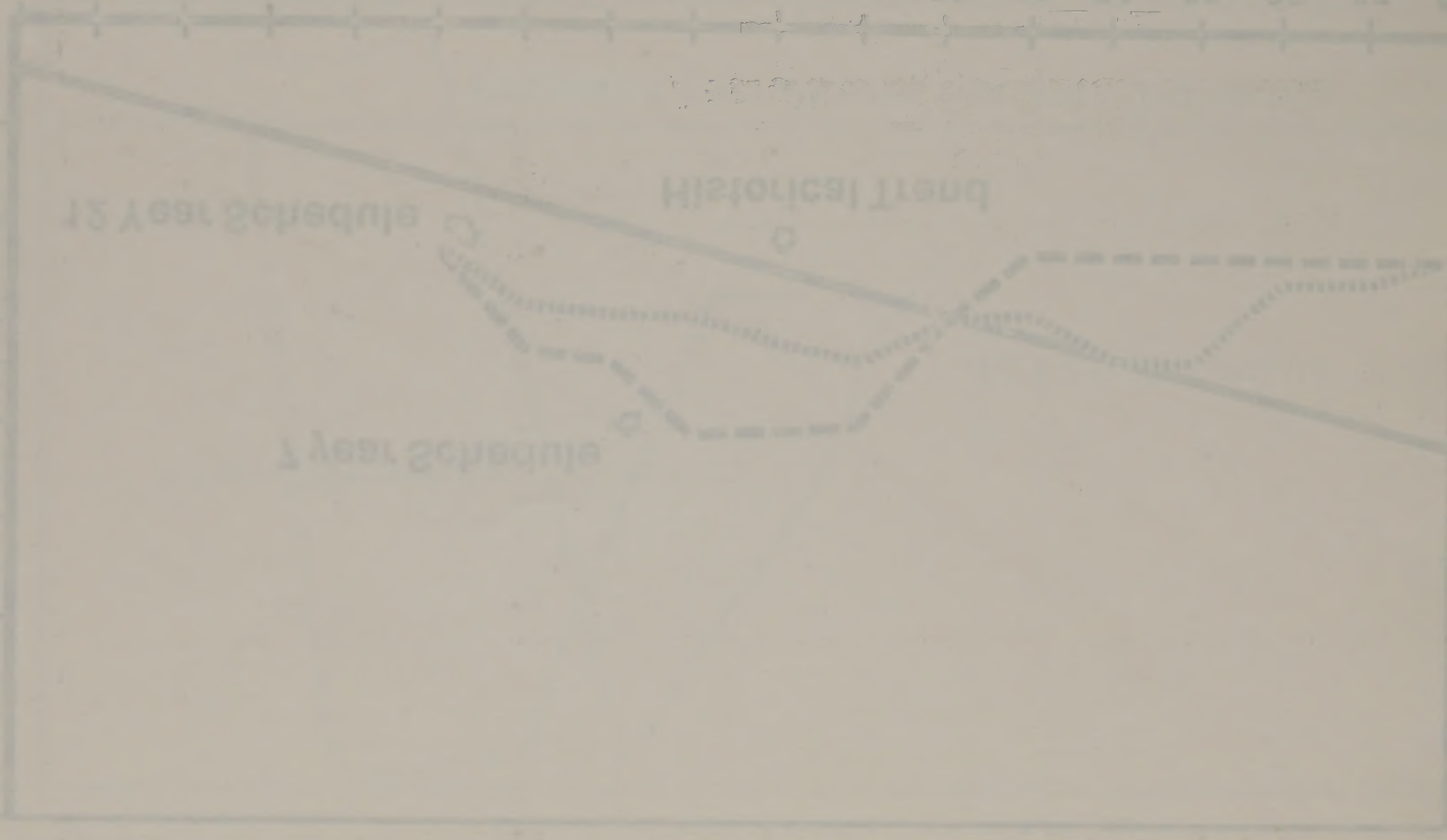




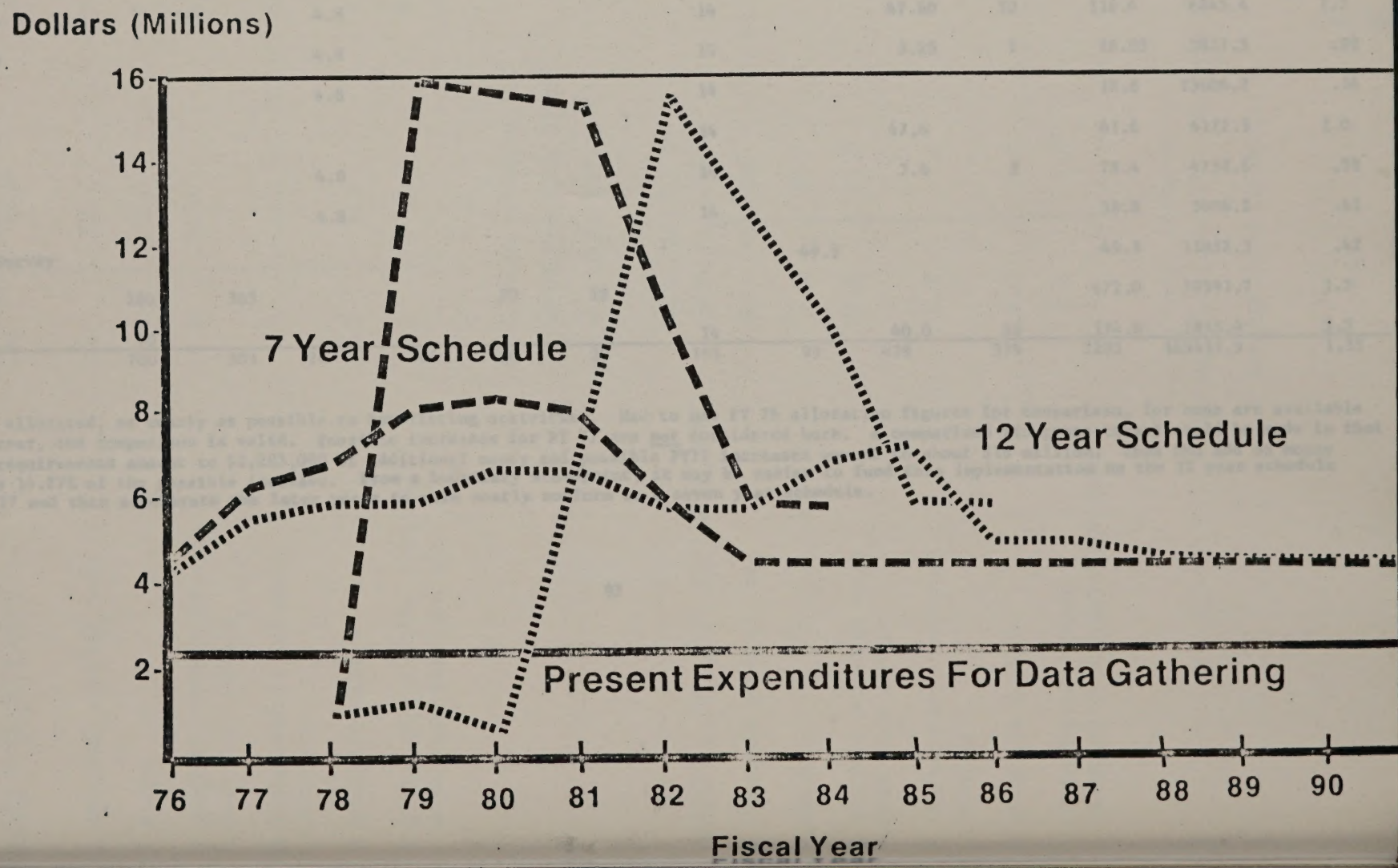
Cost Summary

Strategic Plan





Long Range Alternatives & Total Cost



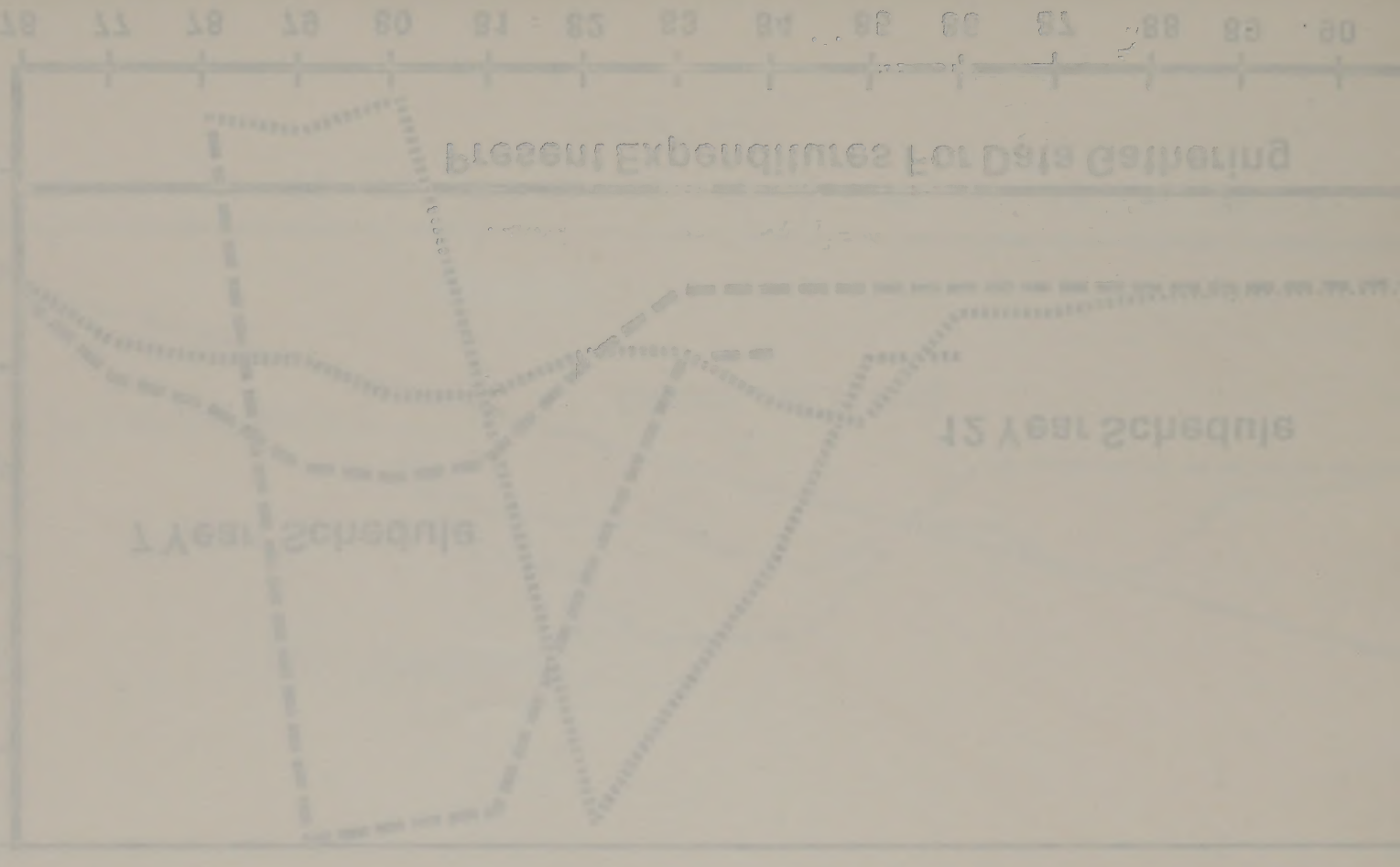


FIGURE 21:
IMPACT IN FY 77 OF SEVEN YEAR SCHEDULE IF FUNDED FROM EXISTING APPROPRIATIONS:

(all figures in $1,000)

Subactivity	Denver Computer Center	State Office Hdwre.	District Office Hdwre.	OCS Office Hdwre.	Wash. Office Hdwre	Tele-processing	Resource Inventory Package	Land Records Package	Case Mgmt. Package	Utilization Management Package	Total	Total 76 Activity Allocation	Percent o FY 76 Allocatio
1211 Lands & Realty								49.5	89.95	75	214.45	18625.5	1.1
1212 Onshore En. & Min.							14		100.00	100	214.00	15226.1	1.4
1213 O C S	350			86			53		100.00	100	689.00	51133.0	1.35
1220 Range Mgmt.			4.8				14		47.60	50	116.4	6845.4	1.7
1230/40 Forestry			4.8				14		5.25	2	26.05	2837.5	.92
1260 Watershed			4.8				14				18.8	13606.2	.14
1270 Protection							14		47.6		61.6	6172.3	1.0
1280 Recreation			4.8				14		7.6	2	28.4	4758.6	.59
Wildlife			4.8				14				18.8	3006.2	.62
1400 Cadastral Survey								49.5			49.5	11852.3	.42
1700 Gen. Mgmt.	280	303			70	19					672.0	39391.7	1.7
5230 O&C Fund	70						14		40.0	50	174.0	7815.4	2.2
TOTAL	700	303	24	86	70	19	165	99	438	379	2283	169417.9	1.35

Notes:
Costs have been allocated, as nearly as possible,to benefitting activities. Had to use FY 76 allocation figures for comparison, for none are available for FY 77. However, the comparison is valid. Possible increases for FY 77 are not considered here. A comparison (in gross terms) could be made in that implementation requirements amount to $2,283,000 of additional money and possible FY77 increases amount to about $16 million. Thus the add on money required here is 14.27% of the possible increase. From a budgetary standpoint, it may be easier to fund this implementation on the 12 year schedule during FY 76 & 77 and then accelerate the later years to more nearly conform to a seven year schedule.

FIGURE 22: SITE TYPE CONCEPTUAL COST ANALYSIS

STATE SITE TYPE COST	Unit Cost $1000's Low	Unit Cost $1000's High	Total Cost $1000's Low	Total Cost $1000's High
1 terminal control unit	30.	70.	30.	70.
1 modem	7.1	10.0	7.1	10.0
2 graphics terminals with hard-copy option	10.0	13.0	20.0	26.0
3 alphanumeric keyboard terminals	2.0	3.5	6.0	10.5
1 graphics tablet	4.5	6.0	4.5	6.0
1 alphanumeric video terminal with hard-copy option	4.0	7.5	4.0	7.5

Cost Range estimate for State Office Site Type: $130.0

Average Cost Estimate: $100.8

DISTRICT, OCS, BIFC SITE TYPE COST	Unit Cost $1000 Low	Unit Cost $1000 High	Total Cost $1000 Low	Total Cost $1000 High
1 terminal control unit	30.	70.	30.	70.
1 modem	7.1	10.0	7.1	10.0
1 graphis terminal with hard-copy option	10.0	13.0	10.0	13.0
2 alphanumeric keyboard terminals	2.0	3.5	4.0	7.0
1 graphics tablet	4.5	6.0	4.5	6.0
1 alphanumeric video terminal with hard-copy option	4.0	7.5	4.0	7.5

Cost Range estimate for District/OCS/BIFC Site Type: $59.6 $113.5

Average Cost Estimate: $86.5

	Unit Cost ($1000's)		Total Cost ($1000's)	
	Low	High	Low	High
1 terminal control unit	30.	70.	30.	70.
1 modem	7.1	10.0	7.1	10.0
1 graphics terminals with hard-copy option	10.0	13.0	10.0	13.0
1 alphanumeric keyboard terminals	2.0	3.5	4.0	7.0
1 graphics tablet	4.5	6.0	4.5	6.0
1 alphanumeric video terminal with hard-copy option	4.0	7.5	4.0	7.5

Cost Range estimate for

Average Cost Estimate:

FIGURE 22 (cont'd)

WO & DSC SITE TYPE COST	Unit Cost $1000 Low	Unit Cost $1000 High	Total Cost $1000 Low	Total Cost $1000 High
1 terminal control unit	30.	70.0	30.0	70.0
1 modem	7.1	10.0	7.1	10.0
1 alphanumeric keyboard terminal	2.0	3.5	2.0	3.5
1 alphanumeric video terminal with hard-copy option	4.0	7.5	4.0	7.5
1 graphics terminal with hard-copy option*	10.0	13.0	10.0	13.0
1 graphics tablet*	4.5	6.0	4.5	6.0

Cost Range Estimate for WO/ DSC Site Type	Low	High
with graphics	$57.6	$110.0
without graphics	43.1	91.0

Average Cost Estimate:	
with graphics	$83.8
without graphics	62.

for those divisions/ADs which need them

FIGURE 22 (cont'd)

Unit Cost $1000		Total Cost $1000	
Low	High	Low	High
6.3	8.0	6.3	8.0
10.0	13.0	10.0	13.0
4.0	7.5	4.0	7.5
2.0	3.5	2.0	3.5
7.5	10.0	7.5	10.0
30.	70.0	30.0	70.0

B- Long Range Schedule Concurrence

I concur in a _____ year schedule for system design and installation and a _____ year schedule for data collection and deposition in the system. This concurrence provides a time frame guideline for Bureau staff involved in projecting and maintaining schedules and costs estimates for Strategic Plan implementation.

_____ _____

I Concur Date

C. Two Year Schedule and Cost Impact Analysis

Modification (if necessary) and concurrence in this section will be the most important Directorate decision required, since the proposed schedule of activities will start the Bureau on its way toward Strategic Plan Implementation. This two year schedule of activities is based upon all the preceding material in this report to the Director, and on the 7 year long range schedule alternative. It can, of course, be modified to reflect a longer time period for implementation.

The proposed schedule of activities will cost an additional $630 thousand in FY 76 and $2.3 million in FY 77. (If the effort were to commence as soon as possible in FY 76). The specific activities involved are shown on the following chart, plotted into the 24 month time frame. The specific activities are the same as those introduced in Sec. III of this report, and the key numbers are the same.

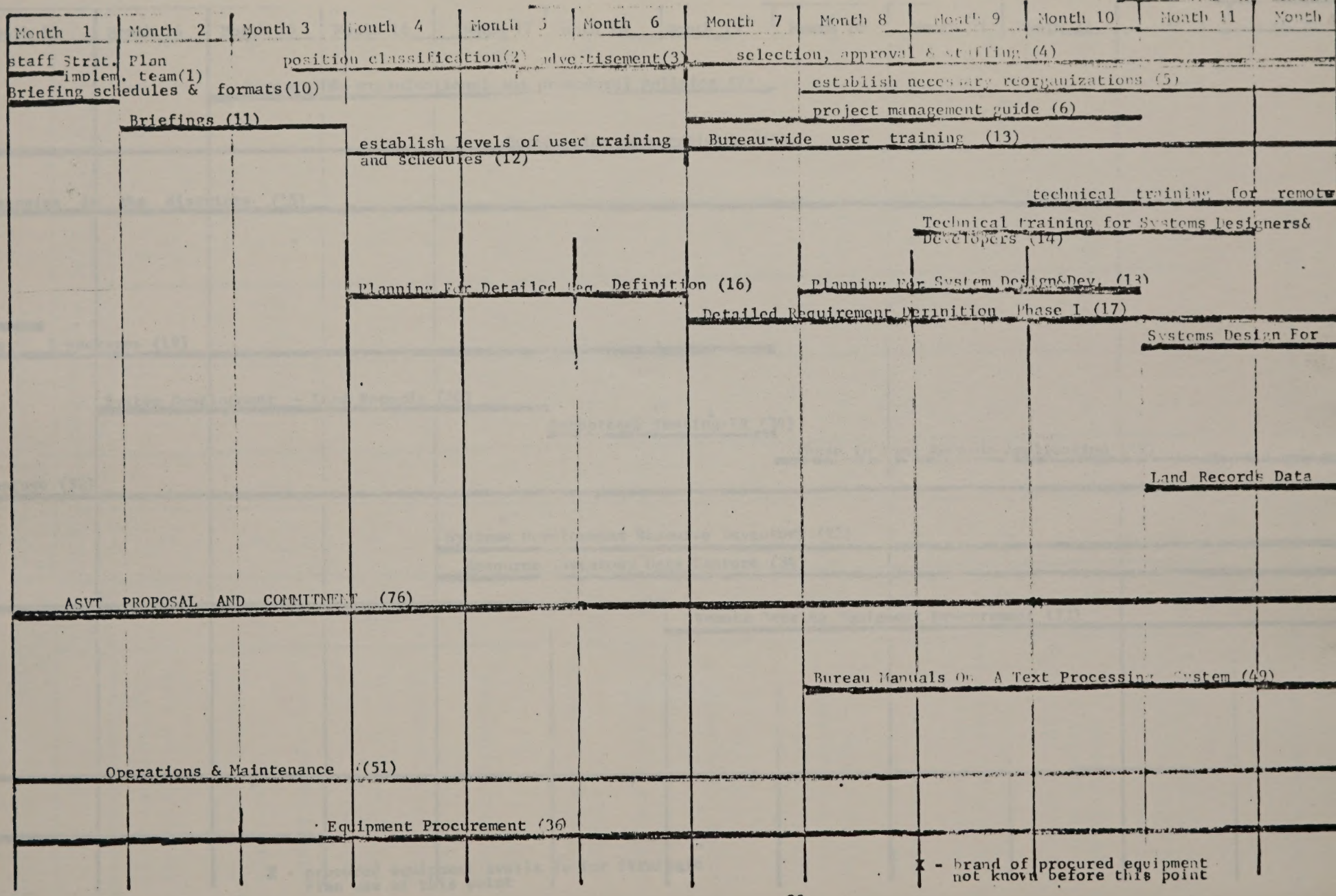
The BLM manpower requirement would be 306 man-months during FY 76 and 524 man-months during FY 77.

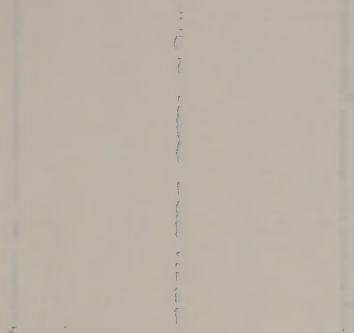
Since the FY 76 & 77 budgets are quite firmly fixed and no new funds are available, starting in FY 76 would require absorbing the cost into the Bureau established programs. The table on page 93 shows the FY 77 impact (of a $2.3 million effort). The FY 76 impact would, of course be made less. Even in FY 77 the $2.3 would require only 1.35% of the Bureau funding, at the FY76 budget level. The table shows this impact spread across the related program, or suggested by the

Div. of Budget and Program Development.

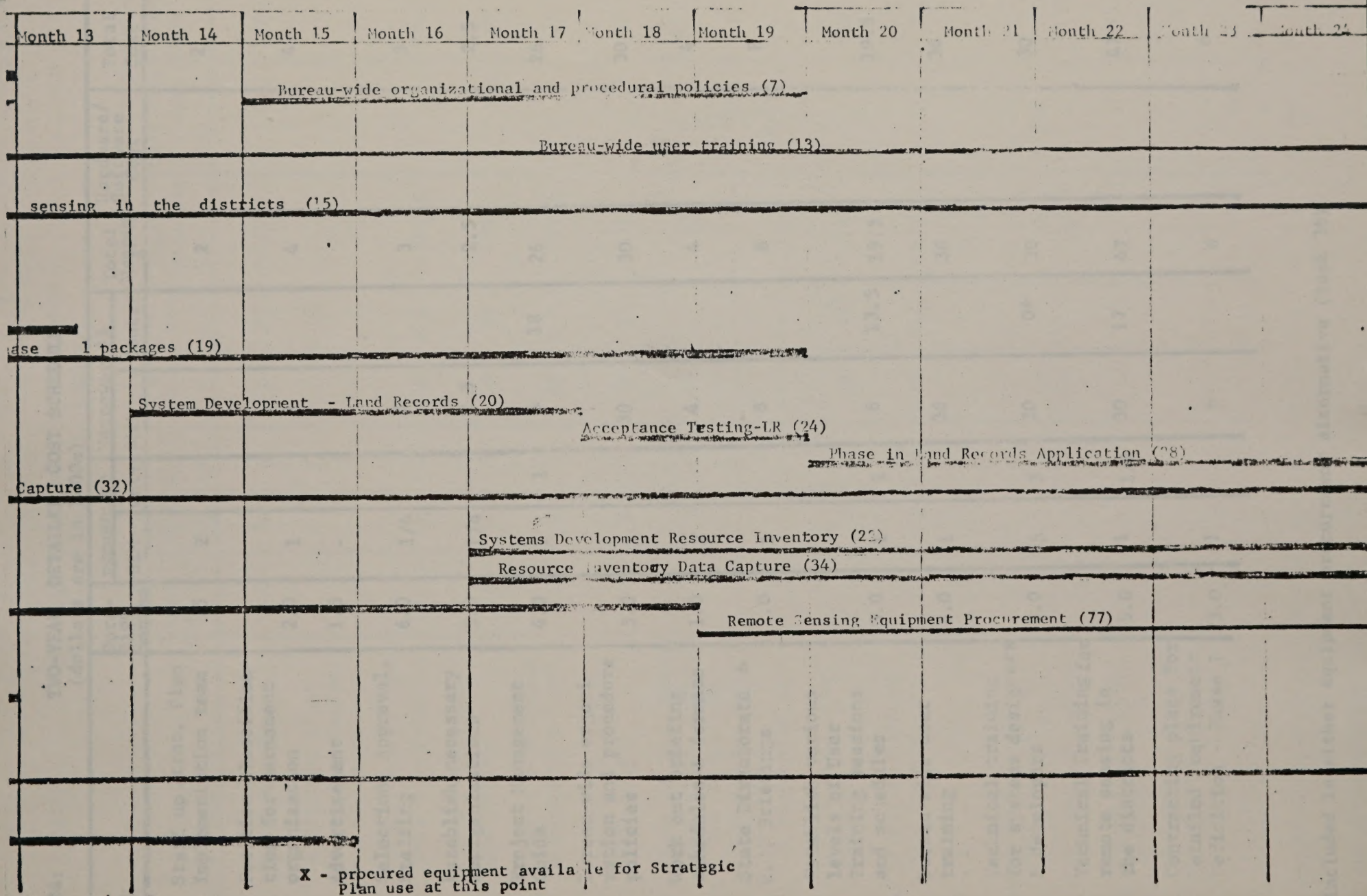
Another way to look at the cost impact of implementation the Strategic Plan is to visualize what might happen if the plan is not implemented. To cast some light on this see Fig. 17. The current ADP budget is $4 million (FY 76). Projecting the FY 71-76 growth level to the end of the 12 year long range development alternative shows that by FY 88 we might well be spending over $8 million annually on ADP costs. If the Strategic Plan is implemented it is estimated that after the highter cost years of system design and implementation, the Bureau will be down to a system operation and maintenance cost of under $5 million annually. All of the above estimates are in FY 76 dollars and none of these includes the costs of collecting and placing data in the system (priority resource inventory). The cost savings are related to the greater efficiency of an organized and planned, and coordinated effort as our current partially coordinated approach. And of course the major benefit projected is the provision of a much more comprehensive and useable information base for Bureau programs, in addition to the possible cost savings.

FIGURE 23:


Month 1
Month 2
Month 3
Month 4
Month 5
Month 6
Month 7
Month 8
Month 9
Month 10
Month 11
Month
staff Strat. Plan implem. team(1)
position classification(2) advertisement(3)
selection, approval & staffing (4)
Briefing schedules & formats(10)
establish necessary reorganizations (5)
project management guide (6)
Briefings (11)
establish levels of user training and schedules (12)
Bureau-wide user training (13)
technical training for remote
Technical training for Systems Designers& Developers (14)
Planning For Detailed Req. Definition (16)
Planning For System Design&Dev. (13)
Detailed Requirement Definition Phase I (17)
Systems Design For
Land Records Data
ASVT PROPOSAL AND COMMITMENT (76)
Bureau Manuals On A Text Processing System (49)
Operations & Maintenance (51)
Equipment Procurement (36)
X - brand of procured equipment not known before this point



LE OF TASKS



X - procured equipment available for Strategic Plan use at this point

FIGURE 24: TWO-YEAR DETAILED COST SCHEDULE
(dollars are in 1000s)

TASK	Duration months	manpwr/mo BLM	manpwr/mo Contr	Manpower $$ BLM	Manpower $$ Contr.	Total Manpwr $	Hardware/ Software Cost	Total Cost
1. Staff up Strat. Plan implementation team	.5	2		2		2		2
2. Position classification for permanent organization	2.0	1		4		4		4
3. Advertisement	1.5	-						
4. Selection, Approval, Staffing	6.0	1/4		3		3		3
5. Establish necessary reorganizations	5.0	1/4		2.5		2.5		2.5
6. Project Management Guide	4.0	1	1	8	18	26		26
7. Bureau-wide organization and procedure policies -I	5.0	3		30		30		30
10. Work out briefing schedules & formats	1.0	2		4		4		4
11. State Directorate & W.O. Briefings	2.0	2		8		8		8
12. Establish various levels of User Training sessions and schedules	3.0	1	1	6	13.5	19.5		19.5
13. Bureau-wide user training	18.0	1		36		36		36
14. Technical training for systems designers & developers	3.0	15	3	30	0*	30		30
15. Technical Training for remote sensing in the districts	15.0	1	1/4	30	17	47		47
16. Contracting plans for Detailed equirement Definition - Phase I	3.0	1		6		6		6

* Included in either equipment procurement alternative (Task 36)

FIGURE 24 (cont'd)

TWO-YEAR DETAILED COST SCHEDULE
(dollars are in 1000s)

TASK	Duration months	Manpower per month		Manpower SS		Total Manpower Cost	Hardware/ Software Cost	Total Cost
		BLM	Contr.	BLM	Contr			
17. Detailed Requirement Definition Phase I	6.5	20	3	26	87.8	347.8		347.8
18. Contracting plans for systems design and development	3.0	1		6		6		6
19. Systems Design for Group 1 packages	9.0	10	5	180	202.5	382.5		382.5
20. Systems Development Land Records	4.0	10	3	80	54	124		124
22. Systems Development-Resource Inventory	9.0	20	5	36	202.5	562.5		562.5
24. Acceptance Testing-Land Records	2.0	8	3	32	27	59		59
28. Phase in Land Records Application: includes	5.0	3		30		30		491.1 [1]
New Orleans OCS							86.5	
Los Angeles OCS							86.5	
Anchorage OCS							86.5	
2 state offices							201.6	
32. Land Records Data Capture	14	1	5	28	91 [3]	119		119
34. Resource Inventory Data Capture	8 [2]	10	30	160	312	472		472
36. Equipment Procurement Activity: if lease or purchase:	15.0	2		60		60	1,600	1,660
if service contract	5.0	2		20		20		20
51. Operations & maintenance								
if lease or purchase:								2,990
if service contract:								1,300

1) monthly communication costs are part of Task 51. See Site Type Cost Analysis (page) for details.

2) two field seasons

FIGURE 24 (cont'd)

TWO-YEAR DETAILED COST SCHEDULE
(dollars are in 1000s)

TASK	Duration Months	Manpower per month		Manpower $$		Total Manpower $$	Hardware/ Software Cost	Total Cost
1. Release B5500	1	1/4		.5		.5		.5
Implement text processing for Bureau manuals	5	5	1	22.5[4]	22.5	45		45
6. ASVT Proposal & Commitment	18	5		180		180		180
7. Remote Sensing Equipment Procurement	2	1		4		4	500	504

SUMMARY OF TWO-YEAR DETAILED COST

Total BLM Man-months		830
Total Contractor man-months		462
Total Manpower Cost	$ 2,630,300	
Total Hardware Cost	2,561,100	
Operations & Maintenance	2,990,000	
	8,181,400	

4) $900 per month

D. Two Year Schedule Concurrence

This concurrence will authorize Bureau staff to make changes in AWP Plans and WAR sheets as necessary to provide for the accomplishment of the specified activities during FY 76 & 77.

_____ _____

I Concur Date

1. Staff up Strategic Plan implementation staff

Until activities 2 through 4 are completed, it will be necessary to temporary detail various skills and designate an acting chief to begin implementing the approved Strategic Plan. This task must include acquisition of space and necessary supplies and understanding by all involved of responsibilities and objectives.

2. Position Classification

The permanent Strategic Plam Implementation staff may involve positions that are new to BLM. Time must be scheduled for designing, approving and classifying these positions.

3. Advertisement

This is a standard Bureau task and probably cannot be shortened. Depending on the results and impacts of Position Classification, this task may be delayed.

4. Selection, Approval and Staffing

The length of time for this task depends on the grade levels established in task 2. The time schedule and the Long-Range Schedule and Detailed Two-Year Schedule assume at least one grade level 13 or above and an appropriate time period for Washington Office approvals.

5. Establish necessary reorganizations

This task includes both personnel and organizations changes that are necessary. If implementing the Plan requires minor Bureau impact, this taks may be greatly shortened or eliminated.

6. Develop and Approve Project Management Guide

The project management guide is written documentation containing guidelines for and responsibilities of any Bureau personnel interacting with ADP-supported systems within the Systems Life Cycle from user proposals and user requests thru systems operations and maintenance. The Guide must be complete through systems design before any systems design should start (activity 19). These guidelines would be very useful in expediting the development of the Statement of Work (SOW) for Systems Design and Development contracting plans (activity 18) and therefore should be underway before those contracting plans start. The finished guide would contain four major sections as follows:

I. Project Initiation

This section will describe each step from receipt of a user request through evaluation of the request, assignment of a responsible individual through the planning and scheduling to accomplish the project. The Project Notebook will contain all information about the project including project description, schedules, responsible individual(s), acceptance check list, etc.

A. Recognizing User Requirements

B. Assignment of Project Monitor

C. New Project Acceptance

D. Project Notebook Development

5. Establish necessary reorganizations

This task includes both personnel and organizations changes that are necessary. If implementing the Plan requires minor Bureau impact, this task may be greatly shortened or eliminated.

6. Develop and Approve Project Management Guide

The project management guide is written documentation containing guidelines for and responsibilities of any Bureau personnel interacting with ADP-supported systems within the System Life Cycle from user proposals and user requests thru systems operations and maintenance. The Guide must be complete through systems design before any systems design should start (activity 19). These guidelines would be useful in expediting the development of the Statement of Work (SOW) for Systems Design and Development contracting plans (activity 18) and therefore should be underway before those contracting plans start.

The finished guide would contain four major sections as follows:

1. Project Initiation

This section will describe each step from receipt of a user request through evaluation of the request, assignment of a responsible individual through the planning and scheduling to accomplish the project. The Project Notebook will contain all information about the project including project description, schedules, responsible individual(s), acceptance check lists, etc.

A. Recognizing User Requirements

B. Assignment of Project Manager

C. New Project Acceptance

D. Project Notebook Development

II. Analysis and Design

This section will describe the process(es) associated with design, user review and concurrence and development of a plan for testing. It will reference the documentation guide and other procedures as appropriate.

A. Analysis: The Process

B. Analysis: The Results

C. Design: The Design Plan

D. Status Reporting and Review

E. Final Design Review

F. The Test Plan

III. Programming

This section will describe the steps involved from receipt of the design specification through development, test and documentation.

A. Preparation For Planning

B. Program Design

C. Programming Conventions

D. Reporting and Acceptance Criteria

E. Program Documentation

IV. Acceptance and Installation

This section will describe all the requirements associated with acceptance of the system and/or program developed. It lays out all the requirements for orderly implementation and maintenance.

A. Documentation Review

B. Interim Installation

C. Acceptance Testing

D. Program Turn-Over

7. Bureau-wide organizational procedures and policies - Phase I

Products of the Detailed Requirement Definition (Activity 17) for Resource Inventory, Land Records, Case and Utilization Management include necessary procedures for manual system changes, encoding, requesting information from an application package, functional relationships associated with the procedures. These kinds of information need to be approved and disseminated on a Bureau-wide basis and will probably require Manual changes and supplements. The time scheduled for this could be cut in half or third if the existing Bureau Manuals were on a text processing system prior to ths task.

8. Bureau-wide organizational procedures and policies - Phase II.

Organizational and procedures policy for URA, NFP, EAR - EIS, Program Planning and Regional Analysis applications may result in Bureau Manual changes and other Bureau-wide impacts. This time period is for developing, approving and disseminating the necessary information using current Bureau techniques. This task cannot be initiated before the Detailed Requirement Definition (Task 53) is complete and it should be finished before any acceptance testing takes place.

9. Bureau-wide organizational procedures and policies - Phase III.

Organizational and procedural policy for ADP, Property, Accounting,

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Payroll and Protection may result in Bureau Manual changes and other Bureau-wide impacts. This time period is for developing, approving and disseminating the necessary information. This task cannot be initiated before the Detailed Requirement Definition (Task 79) is complete and it should be finished before any acceptance testing takes place.

10. Work out briefing and schedules and formats

This task will result in decisions on organzational levels to be briefed on the Strategic Plan, approved travel schedules for BLM staff assigned to this task, briefing content and visual aids appropriately geared to the different audiences, calendar appointments cleared for briefing attendees, etc.

11. State Director and W.O. Briefings

These briefings will give the State Directors the opportunity to understand the Strategic Plan, what the plan will do for them and what it will cost. Their critique will provide refinements to future tasks before those tasks get started. Most importantly, their understanding of the Plan and desire to participate in it are critical to the success of the Application Development tasks since their personnel are to be heavily involved. This task could be shortened considerably by briefing all S.D.'s in one session. The possibility of getting all S.D.'s together during the summer months is questionable. Also, it precludes any S.D. staff from attending the briefings.

12. Establish various levels of user training sessions and schedules

This task includes development of on-the-job and formal training sessions for management and staff. These sessions need to be scheduled enough in advance so that attendance is assured and appropriate training and budget inputs to AWP's are available. Depending on availabilty of appropriate personnel developing these sessions, the task could start earlier.

13. Bureau-wide training for users

This is an on-going effort to provide continuous interface between user education needs and satisfaction of those needs on an organized schedule. It will include training for (a) site personnel on newly installed applications and/or new equipment (b) new Bureau employees to introduce them to our Strategic Plan concepts and operations (c) explaining application package change recommendations that are accepted and implemented, (d) various management levels to introduce state-of-the-art changes in data processing and remote sensing and gains to be realized by applying those state-of-the-art changes in BLM.

14. Technical training for systems designers and developers

Technical training for BLM ADP personnel is necessary to bring them up to speed in 3rd generation State-of-the-ADP-art. The alternative of doing systems design and development with all contracted manpower would eliminate the immediate need for this task but it would also leave the Bureau with no knowledge of those applications and with no computer programmers with skills to maintain those programs.

15. Technical training for remote sensing applications

With the coming of the satellite, radar, radiometry, sonar, multispectral scanners and a host of other systems for consideration within Strategic Plan, the scientist will see a great change in the methods of gathering natural resource data. It was assumed that most all natural resource specialists hired by the Bureau had some training in the use of black and white aerial photography, but that there would be a need for training in the uses of the new imagery systems. In 1972, the Branch of Special Mapping, DSC, was requested to make a survey of these needs. Findings point out that there is a serious need for basic remote sensing training in the Bureau, which must proceed before it can consider adopting more sophisticated sensor systems. Therefore basic training can start as soon as possible. The task will be stronger after the Detailed Requirement Definition - Phase I (Task 17) is underway so that the content of the training course can take advantage of the detailed documentation on remote sensing requirements for data gathering. This task should be well established by the time data capture efforts (Task 32-34) are underway so that the training can make use of advantages of on-the-job training. One alternative to Bureau training is to contract for all our remote sensing expertise. Although this would alleviate the training requirement, it would (1) be more costly (2) require extensive on-the-ground knowledge of the contractor which may make usable contractors hard to find in some areas.

16. Contacting and Bureau plans for DRD - Phase I

The Bureau has two reasons for needing contractor assistance on this task: (A) manpower limitations in the current ADP staff prohibit detailing for such a long period the personnel with the skills required for this activity (B) our current skills levels do not include up-to-date experience with developing 3rd generation ADP capabilities or implementing large data base systems. The length of time for this task assumes some form of an RFP will be necessary.

Besides contracing plans, it is very important that appropriate user specialist are available who

.are thoroughly knowledgeable in their program activity

.have Bureau-wide credibility and respect from their counterparts at other organizational levels

.are aware of overall Bureau operations and policies

17. Detailed Requirement Definition - LR, RES, CM, UM

This task is described in detail on pages 66 through 68 including the alternatives that were considered. The DRD task is considered the "go point" from the users' view as this is where he/she becomes heavily and continually involved. Assuming one Strategic Plan objective is to give the user concrete benefit as soon as possible after the "go" has been given (which is the starting day of this task), the relationship of this task with tasks 19 through 27 should be kept as tight as the Bureau can afford. Since systems design (see Task 19 narrative) cannot start until the hardware configuration is known, the only event

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that can cause an earlier start to the DRD is to shorten the equipment procurement task (Task 36).

18. Contacting plans for systems design and development

Given the total manpower requirement for application systems design and development, a decision will have to be made regarding the proportion of available in-house expertise to use and its contracted man-months compliment.

The balance must include acquiring a sufficient amount of in-house expertise to maintain the application after the acceptance testing task when contractor support is usually finished.

19. Systems design for Group I

Once the Detailed Requirement Definition (#17) has progressed to sufficiently define an application area and necessary organizational changes approved (Task #5), a systems design team can proceed. (Refer to page 69 for a discussion on systems design.) Because systems design is affected by the equipment configuration to be used, the task cannot start before an award has been made on an equipment RFP or a computer services/facilities management contract approved (Task #36).

For the same reasons that the Detailed Requirement Definition task contains a group of applications, so is it recommended for this task. Although a seperate design effort for each of the four applications would allow more schedule flexibility, four seperate tasks

- would take longer
- would be more prone to design ommissions or inefficiencies

The task as shown on the Long-Range Schedule Chart is planned as soon as it can start in relation to the Detailed Requirement Definition. It may be moved further into the future at the proportional expense of delaying the point of realized benefit for the users.

20. Systems development - Land Records (LR)

Systems development was discussed in general as part of the System Life Cycle (page 69). Assuming that initial emphasis in the System Design (Task 19) is on Land Records, Land Records systems development could start about quarterway through the System Design task. LR was chosen to be first in development since those processes and information are basic to all BLM work. This task cannot start before the programmers have access to the machine the application is to be run on. Development could be delayed to any point further in the future at the expense of delaying the point of realized benefit for the user and losing a portion of the momentum in completing this phase.

21. Systems development - Case Management (CM)

Because Case Management is basically a State Office funtion and because Land Records is also, development and implementation of Case Management computer programs will use the same equipment and take advantage of the already established learning curve. (See Task 48 for Field Site Configuration procurement.)

22. Systems Development - Resource Inventory (RES)

System development for Resource Inventory cannot start any sooner since it is dependent on the development and implementation of appropriate data collection systems by each of the resource disiplines which are intergrated. 1/ The DRD (Task 17) and System Design (Task 19) will do much to assist the disiplines in designing a coordinated resource inventory system. Depending on the output of those two tasks, Resource Inventory Systems development may be started much later than indicated here and/or require a much larger period of time to complete.

23. Systems development - Utilization Management (UM)

Because Utilization Management is more or less an extension of Case Management, the Systems Development of CM should precede UM development. The team programming CM will be knowledgeable in the subject matter and as work on CM decreases they can smoothly pick up on UM development.

24. Acceptance Testing-(LR)

Acceptance testing cannot begin until systems development is completed. And it should not be put off. The systems development team will be responsible for any computer program changes that are necessary to get user acceptance. Delay of acceptance testing means that the development team is idle for the period of delay or they are reassigned and likely unavailable.

Acceptance testing will take place at pilot user sites. It must be

1/ Reference to paper "Coordinated Resource Inventory System"

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22. System Development - Resource Inventory (RIS)

System development for the new Resource Inventory cannot start any sooner since it is dependent on the development and implementation of appropriate data collection systems by each of the resource disciplines which are interpreted. 1/ The DED (Task 17) and System Design (Task 19) will do much to assist the disciplines in designing a coordinated resource inventory system. Depending on the output of these two tasks, Resource Inventory System development may be started much later than indicated here and/or require a much larger period of time to complete.

23. System development - Utilization Management (UM)

Because Utilization Management UM more or less an extension of Land Management, the System Development of UM should precede CM development. The team programming CM will be knowledgeable in the subject matter and so work on CM decisions they can smoothly pick up on UM development.

24. Acceptance Testing-(AT)

Acceptance testing cannot begin until system development CM completed. And it should not be put off. The system development team will be responsible for any computer program changes that are necessary to get user acceptance. Delay of acceptance testing means that the development team is idle for the period of delay or they are reassigned and likely unavailable.

Acceptance testing will take place at pilot user sites. It must be

1/ Reference to paper "Coordinated Resource Inventory System"

coordinated with

- the installation and acceptance of various field site equipment: Task 48
- on site application package training for users: Task 13
- Land Records data capture: Task 32

The length of time and expense of acceptance testing depends on factors such as:

- how many sites will be included in the task
- how much travel is involved
- Management's decision on acceptance testing for all four application packages simultaneously or individually (as shown on the Long-Range Schedule of Tasks)
- availability of personnel to be involved in the task

25. Acceptance testing- (CM)

Same as Task 24.

26. Acceptance testing - (RES)

Same as Task 24.

27. Acceptance testing - (UM)

Same as Task 24.

28. Phase in the LR Application

The length of time and fiscal year cost spread for this task depends

on Management's decisions on geographic priorities and the priority for the Land Records & Management program on a Bureau-wide basis. These priorities must be known enough in advance to coordinate three critical support tasks:

(a) the installation and acceptance of appropriate field site equipment-terminals, terminal control unit, modem, supplies (Tasks 48)

(b) on-site application package training for users (Task 13)

(c) a usable data base which is a product of the Land Records data capture (Task 32).

(d) fiscal planning for necessary funds and man-months

29. Phase in the CM Application

Same as task 28 except a usable data base requires Case File data capture (task 33).

30. Phase in RES Application

Same as task 28 except a usable data base requires Resource Inventory data capture (Task 34).

31. Phase in CM Application

Same as task 28 except a usable data base requires data capture of Land Records, Case File and Resource Inventory (Tasks 32, 33, and 34).

32. Land Records Data Capture

To have usable data in a computerized medium available when needed during

the systems development process (activity #20), it is necessary to begin this task sufficiently before. The geographic areas to receive first encoding emphasis are those sites chosen for acceptance testing (Task 24).

Because the duration of this task is entirely dependent on alternatives and schedules chosen for Land Records System development, there are no alternative schedule considerations for this task.

33. Case File Data Capture

This task has the same relationship to Case Management system development (Task 20) as Land Records data capture to LR systems development described above.

34. Resource Inventory Data Capture

This task has the same relationship to Resource INventory Systems development (Task 22) as Lands Records data capture LR systems development - See Task 32. A major difference is that RES data capture concerns data not previously recorded in any format. This reason alone dictates a much longer time period for the task than the other data capture tasks which concern data already available in some, even if unacceptable, format.

35. Phase out current production systems .

This is the orderly change from old procedures to new procedures. The scope of this task depends on conversion plans made earlier. In cases where the old computer system related to more application packages

than the application package/sub-package being phased in, it may not be possible to seperate the new procedure out of the old system.

In this case both old and new methods may have to remain until all new applications associated with the old systems are available.

This situation will be most true for the Utilization Management package. At least four current ADP systems are associated with the UM package -

Range Management

Material Sales

Lease Management System

Coal Lease Data

Range Management and Material Sales also support Accounting and Fund Control (AFC) processes. These 2 current ADP systems will have to remain active to continue that AFC support since the AFC package is not planned until Phase III of the Strategic Plan. As an alternative, the support can be processed by manual methods until AFC is available.

36. Equipment Procurement Task

This task includes all the work necessary to get from our current data processing equipment to a state-of-the-art equipment configuration that will adequately support BLM's data processing needs within the concept of the Strategic Plan. There are two major ways of getting there:

- a BLM procurement effort to buy/lease the necessary equipment configuration

- a service contract through GSA which includes use of equipment

The proportional duration of time are significantly different. Analysis of the work involved for each alternative shows why.

WORK ITEMS	BLM Procur.		Service Contract	
	REQ.	Not REQ.	REQ.	Not. REQ.
facilities site preparation	6 mos.			X
current B5500 situation resolved	X		X	
RFP to OADPM for clearance	½mos.			X
GSA clearance	2mos.		2wks.	
establishment of Technical Evaluation Conv.	1mo.			X
benchmark & evaluation criteria	1mo.			X
RFP's to vendors, vendor conferences, vendor benchmark preparation, proposals back from vendors	1mo.			X
Benchmark demonstrations	1mo.			X
Proposal evaluations	1mo.			X
Defense contract audit	1mo.			X
contract negotiations & final offers	1mo.			X
Soliciter's Review & Congression notice	1mo.			X
Prepare conversion schedule	1mo.		1mo.	
Develop System Software (Overview)	2mos.			X
Current System Conversion on Vendor Equipment	2mos.		2mos.	

(Do not try to add the months as some of those activities occur simultaneously.)

41. Lead time for equipment installation

This task represents the period of time from contract award to delivery date at the specified site. This time span is required regardless of the choice between BLM procurement or service contract (see task 36) and is approximately the same duration.

42. Conversion on new equipment

Although current systems will have to be reworked eventually for integration into the overall Strategic Plan, their immediate conversion into the new configuration is required to ensure uninterupted support to current system users. The new configuration is carefully monitored to ensure performance as expected. When Bureau users are satisfied, the B5500 version can be dropped. As fewer jobs are on the B5500 and more on the new configuration, reliance on the B5500 will decrease to the point that there is more reliance on the new configuration than on the B5500 and eventually to total reliance on the new equipment at which time tasks 47 and 51 can start.

47. Release B5500

Regardless of the alternative taken regarding equipment procurement activity (Task 36), the release of our B-5500 computer signifies total reliance on new equipment, processes and concepts in data management support.

48. Field Site configuration procurement task

This task deals with the efforts necessary to install terminals of the variety listed on pages 51 and 52 in appropriate state offices, district offices, DSC divisions, OCS offices, etc. Because the schedule, for this task is totally dependent on the phasing in of various applications (Tasks 28 through 31), schedule change possibilities are not considered here. This task and phasing in of applications must be so coordinated that (a) equipment does not sit idle at the site because the application isn't ready (b) a site trained and ready for acceptance testing of an application has no equipment to run it on.

49. Bureau Manuals in a text processing system

This task includes installation of the text processing capability at the Service Center and W.O. for supporting the maintenance of Bureau Manuals. Early implementation of this capability for Bureau manuals serves several useful purposes:

- it will significantly assist in the efforts to change and/or add and disseminate Manual information which is sure to occur as the Strategic Plan progresses
- with very little resources ($45,000 est.) the Bureau Manuals will be on a text processing capability and preparers of Manual Supplements, directives, etc. will have a Strategic Plan product in a short period of time.
- since the text processing capability will be available for field sites to tap into as soon as the site has an appropriate

terminal configuration, it will provide a ready and familar training tool for using the equipment as well as making available the necessary policies, instructions and guidelines associated with the application packages as they are phased into the field site.

51. Operations and maintenance

Operations and maintenance (O & M) for computer systems is discussed in Section III.E. but the task will change from O & M for seperate systems to O & M for integrated systems as the Strategic Plan progresses and application packages are designed and developed. This task will be necessary throughout the life of BLM.

52. Contracting Plans For Detailed Requirement Definition-Phase II

This task is similar to Task 16 except it concerns a different group of application packages. It is possible that our experience doing the DRD-Phase I (Task 17) will allow us to do DRD-Phase II entirely in-house. In that case Phase II of the Strategic Plan can move faster as this task can be eliminated.

53. Detailed Requirement Definition - LRA, MTP, EIS, PP, RA

Because these packages all relate to the Bureau's current planning system and because the planning system is relatively well established, this DRD may take much less time than DRD-Phase I.

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54. Technical Training For Designers and Developers

This task is a repeat of Task 14. If a sufficient number of ADP technical personnel, familar with the hardware and software configuration, are available for systems design and development this training may not be necessary.

55. Systems Design For Phase II Packages

Once the DRD (#53) has progressed to sufficiently define an application area, a systems design team can proceed. This task is shown at it's earliest start date relative to the DRD task. It can be postphoned to any future data with the same impact as noted for Systems Design in Phase I (Task 19).

56. Systems Development - URA

The URA application package is scheduled for development first. Of the five applications included in this phase, URA is the first program activity to be performed. The development tasks (#56, 59, 62, and 68) in this phase are interchangeable however and/or can be initiated later in the phase as dictated by Bureau priorities and available resources.

57. Acceptance Testing - URA

Same as Task 24.

58. Phase in URA Application

Same as Task 28 except a usable data base resulting from URA Data Conversion (Task 71) must be available for those sites being phase in.

59. Systems Development - RA

Since Regional Analysis processes and outputs are critical to MFP, EIS and Program Planning, it is scheduled for earlier development.

60. Acceptance Testing - RA

Same as Task 24.

61. Phase In RA Application

Same as Task 28 except a usable data base resulting from Regional Analysis Data Conversion (Task 72) must be available.

62. Systems Development - MFP

Much of the work done in URA Systems development (Task 56) will be useful here and, therefore, should be this task shorter in duration than the URA development.

63. Acceptance Testing - MFP

Same as Task 24.

64. Phase in MFP Application

Same as Task 28 except a usable data base resulting from MFP Data Conversion (Task 74) must be available for those sites being phased in.

65. System Development - EIS

This task is currently scheduled to coincide with MFP Systems development. Depending on available resources, it may be moved earlier or later in the schedule.

66. Acceptance Testing - EIS

Same as Task 24.

67. Phase In EIS Application

Same as Task 28 except a usable data base resulting from cataloging available EAR's, EIS's etc. must be available. The EIS Application will not be 100% functional until all the data bases have been established because EAR/EIS preparation may reference them all.

68. Systems Development - PP

As a BLM function, program planning follows MFP developmemt so it is scheduled similarly in the Strategic Plan.

69. Acceptance Testing - PP

Same as Task 24.

70. Phase in Program Planning Application

Same as Task 28 except a usable data base resulting from data conversion of various program plans, projects, etc. must be available. This application will not be 100% functional until many of the Phase III application areas are operational because those application areas are associated with much of the data used in program planning.

71. URA Data Conversion Effort

Depending on the volume and value of existing URA data in the BLM offices, this conversion may take longer or less time than shown here.

72. Regional Analysis Data Conversion

The only existing Regional Analysis data is maintained on magnetic tape at the Service Center. Conversion will be relatively quick (This task does not include gathering new regional analysis data.)

73. EAR/EIS Cataloging

Similar situation as Task 71.

74. MFP Data Conversion Effort

Similar situation as Task 71.

75. Program Planning Data Conversion

Similar situation as Task 71.

76. ASVT Proposal And Formal Commitment

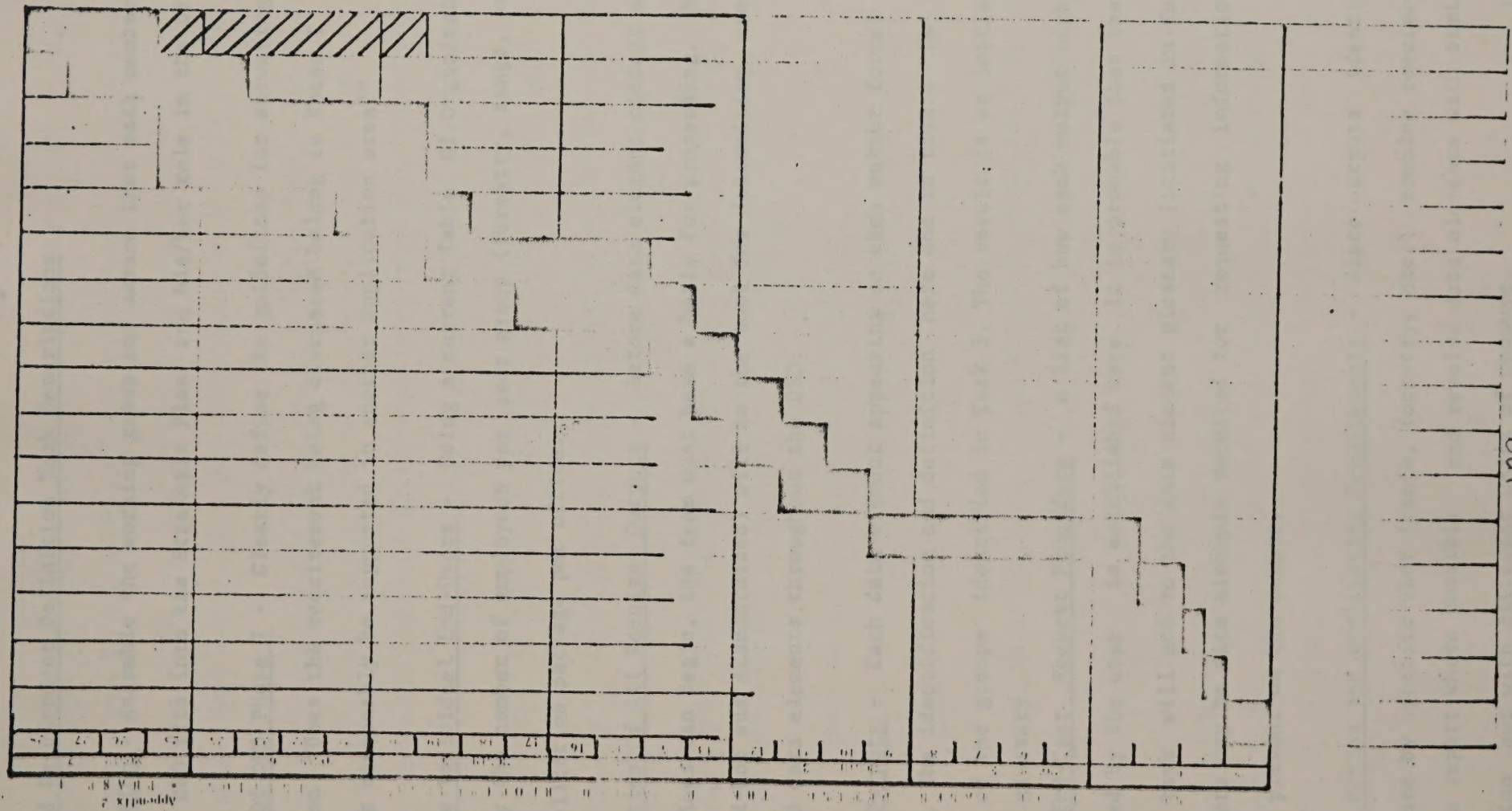
This task will span approximately eighteen months. It is a joint BLM/NASA effort to develop an operational system for the analysis of various remotely sensed data. The operational system to be proposed will include:

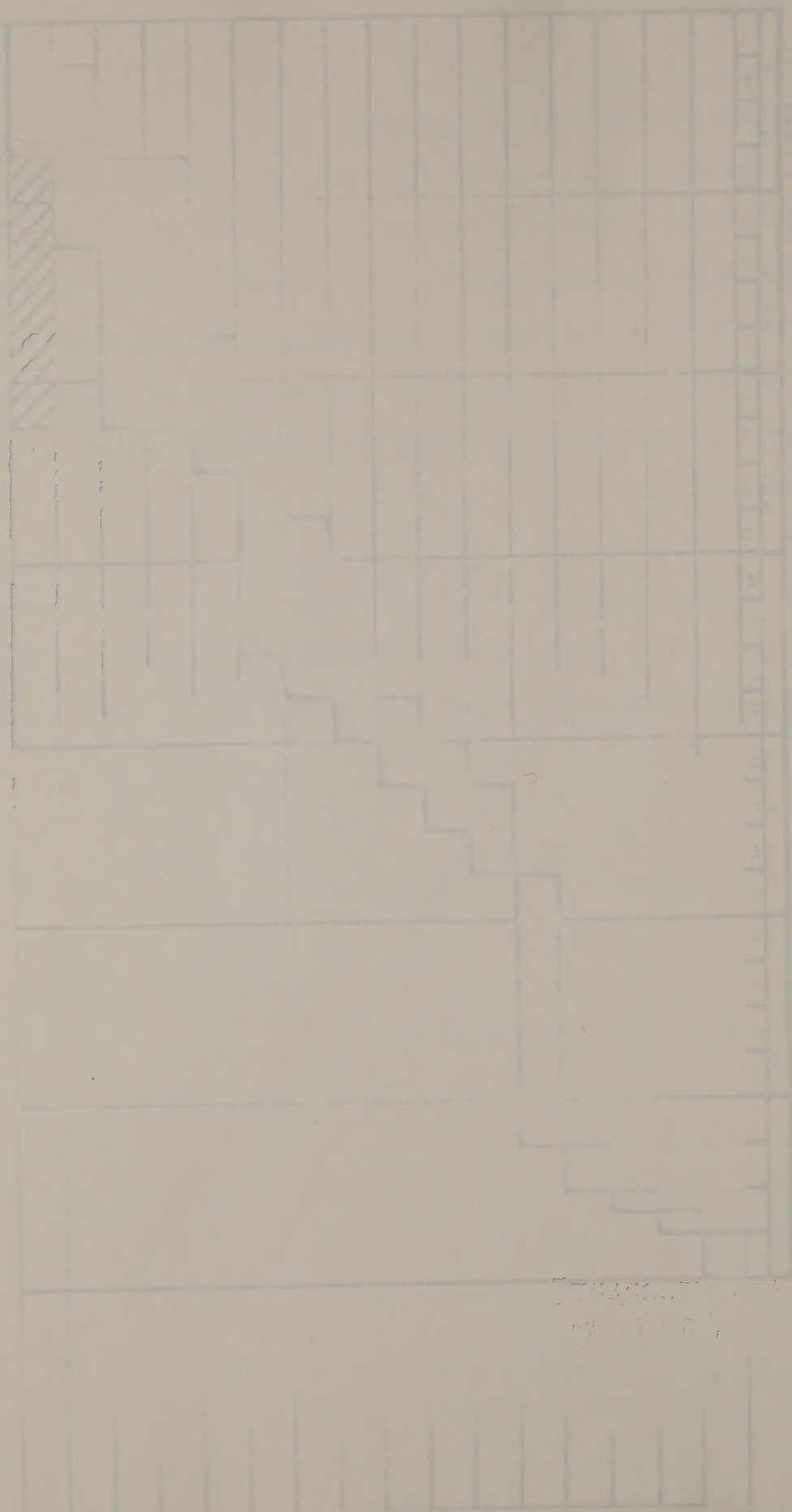
- Bureau funding requirements
- NASA funding requirements
- Bureau remote sensing equipment needs
- personnel needs - skills and numbers

77. Remote Sensing Equipment Procurement

As a result of the preceding task, our remote sensing equipment needs will be known. This task represents the period of time to acquire the proposed and approved equipment. Our equipment procurement may be only for a central location and therefore the time span for this task would be significantly shorter than shown. The relative time period shown here assumes a phased schedule of some sort of sensing and/or analytic equipment at field sites.

Tasks 78 through 103 associated with Phase III of the Strategic Plan are very similar to the descriptions and characteristics of similar tasks in the preceding phases.





Detailed Requirement Definition Task Descriptions

1. Orientation - Assemble the working group and assure that each member knows how the DRD fits into the Strategic Plan and his/her role in the DRD effort.

2. Scope Of DRD Phase I - Clearly define the guidelines for answering the question "Does the requirement being discussed belong in Phase I or would it more reasonably be supported in another application area?"

3. Identify Individual End-Users - Using a current Table Of Organization identify the number of employees per user group (forestry, range, public) per application package per office.

4. List Titles Of All Required Outputs - Before data element content and format definitions can begin, the team must have a basis for proceeding. Reports (both ad-hoc and standardized) will be the tool for determining user required data elements throughout the DRD.

5. Define Outputs - Each data element appearing on each output format must be defined. The identification and definition here and in task 4 is done by each of the groups identified in Task 3. The result is an initial data element glossary.

6. Define End-User Request Procedure - a list of how each output might be requested by the user is established here. It is probable that the results of this task will add to the data element glossary (initiated in Task 5) since there may be data elements required for requesting information that are not present on the output.

7. Resolve common and conflicting Requirements - Since outputs identified in Task 5 are by specific user (range, forestry, etc.) combine requirements into one report where possible and resolve data elements with similar definition but with different units of measure.

8. Determine Data Acquisition Means - From the data element glossary established in Tasks 5 and 6, determine how each data element will be acquired, availability of the data for input and automated checking requirements for each data element. Add this information to the data element glossary.

9. Reconcile Output to Input Discrepancies - During Task 8, it is likely that certain data elements will be dropped (uneconomical to collect) and that others will be added as they are discovered and determined to be necessary (indicating an oversight during Task 5). Output formats established in Task 5 must be updated to reflect any reconciliations.

10. Define Input Formats and Data Entry Procedures - Assemble the data elements from the data element glossary into formats for input and describe how the user will input the data (terminal, input document, over the phone, etc.). The assembly will be into three major categories:

    - those currently in an automated form
    - those that exist on a manually maintained form
    - other

    Data elements existing solely on manually maintained forms or other than a current automated format will be divided by specialty area and will be the responsibility of the associated specialists.

11. Finalize Input and Output Formats - The team assures that each format is achieved by computer without excessive design and development manpower or non-standard hardware devise. This will be a value judgement as to whether the worth of a format justifies its cost.

12. Develop A Procedure For Accepting Changes - In order to continue expeditious progress of the DRD, it is necessary to "freeze" the approved formats from Task 11 while allowing for changes that are controlled. This control will be a team-approved document detailing

- the form a change request must take
- to whom the change is submitted
- identification of an "change review board"
- means of response and disposition for any change request

13. Define Data Base Requirements - From the products developed in previous tasks, a logical data base structure, access and storage requirements are defined.

14. Define Processing Requirements - The processes which tie inputs to data base to output are defined here. These processes include

- editting
- code conversion
- data algorythms
- sorting
- query interpretation
- output formatting

15. Define System Support Requirements - System support requirements are those needed to manage and control the data processing system. These include support as data security, data recovery and backup, data usage and update information; etc.

16. Produce the Detailed Requirement Definition Document - Using all the materials developed to date assemble and publish an easily accessed document. The user specialist group will have prime responibility for this while the technical group works on tasks 13, 14 and 15.

In summary, it is the data element which serves as the common link between those sixteen tasks and between the user specialist and technical groups which make up the DRD team.

The user specialist group represents and interfaces with all users. They will be detailed mostly from the Service Center but organizational as well as functional representation must be considered. It is recommended that two personnel from each of those areas be represented:

- Forestry
- Range
- Wildlife
- Minerals
- Watershed
- Cadastral Survey
- Land Records
- OCS
- Case Handling
- Recreation
- Archeology
- Fire Management

- Cartography
- Remote Sensing
- Record Systems

The technical group is made up of five to seven people with the following skills:

- systems analysis (not necessarily computer systems)
- information systems requirement definition
- advanced operating procedures
- third generation data base and data communication systems
- computer terminal operations

The groups will be coordinated by a project leader responsible for overall DRD direction.

This mixture is meant to allow a workable balance between indepth user involvement and timely progress of the DRD effort.

SITE TYPE EQUIPMENT CONFIGURATION

	UNIT COST $1000s		TOTAL COST $1000s	
STATE OFFICE	low	high	low	high
Public Room				
1 graphic terminal with hard copy option	10.0	13.0	10.0	13.0
4 alphanumeric keyboard terminals	2.0	3.5	8.0	14.0
Land Office Room				
1 graphic terminal with hard copy option	10.0	13.0	10.0	13.0
1 alphanumeric keyboard terminal	2.0	3.5	2.0	3.5
1 graphic tablet	4.5	6.0	4.5	6.0
1 communication control unit	100.0	250.0	100.0	250.0
1 modem	7.1	10.0	7.1	10.0
* * * STATE SITE TYPE TOTAL * * *	135.6	299.0	141.6	309.5
OCS OFFICE				
SAME CONFIGURATION AS THE LAND OFFICE ROOM (SEE ABOVE)	123.6	282.5	123.6	282.5
DISTRICT OFFICE				
1 graphic terminal with hard copy option	10.0	13.0	10.0	13.0
3 alphanumeric keyboard terminals	2.0	3.5	6.0	10.5
1 graphic tablet	4.5	6.0	4.5	6.0
1 terminal control unit	30.0	70.0	30.0	70.0
* * * DISTRICT SITE TYPE TOTAL * * *	46.5	92.5	50.5	99.5

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1 graphic terminal with hard copy option	10.0	13.0	10.0	13.0
1 alphanumeric keyboard terminals	2.0	3.5	3.0	14.0
1 graphic terminal with hard copy option	10.0	13.0	10.0	13.0
1 alphanumeric keyboard terminal	2.0	3.5	2.0	3.5
1 graphic tablet	4.5	6.0	4.5	6.0
1 communication control unit	100.0	270.0	100.0	250.0
1 modem	7.1	10.0	7.1	10.0
* STATE SITE TYPE TOTAL * * *	123.6	209.0	141.6	309.5
SAME CONFIGURATION AS THE LAND OFFICE ROOM (SEE ABOVE)	123.6	282.5	123.6	282.5
1 graphic terminal with hard copy option	10.0	13.0	10.0	13.0
3 alphanumeric keyboard terminals	2.0	3.5	6.0	10.5
1 graphic tablet	4.5	6.0	4.5	6.0
1 terminal control unit	30.0	70.0	30.0	70.0
* DISTRICT SITE TYPE TOTAL * * *	46.9	92.5	50.5	99.5

T/P Monthly Costs

Site	Miles To Denver	[illegible] (½ Duplex)	Maximum (F.D.)	Future (50K Family)	Cost Index ½ High
Anchorage	2389	2175	2175	20,581	12
Phoenix	582	820	898	7029	5
Sacramento	885	1047	1148	9300	9
Wash. D.C.	1489	1509	1646	13,831	10
Boise	636	860	942	7433	6
Cheyenne	96	262	285	1478	1
Santa Fe	232	529	572	4124	2
Billings	450	706	772	5885	7
Reno	787	973	1067	8566	7
Portland	979	1117	1225	10006	11
Salt Lake City	369	620	679	5038	3
New Orleans	1002	1135	1135	1135	8

Form 1279–3
(June 1984)

BORROWER'S CARD

HD
183
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L345
1975

Strategic plan for information systems management, Report to the Director.

DATE LOANED	BORROWER	OFFICE	DATE RETURNED

(Continued on reve

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